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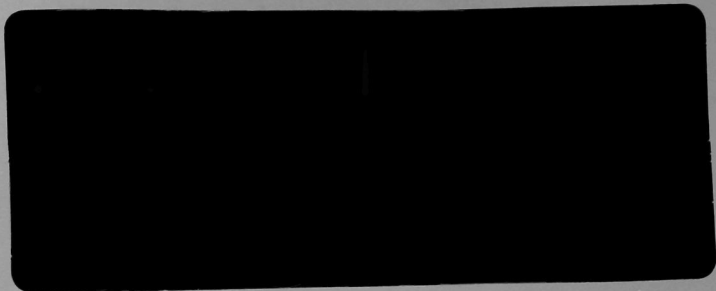
AN ANALYSIS OF PROPOSED LEGISLATION  
TO CONTROL ACID RAIN

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by

D.G. Streets, L.A. Conley, L.D. Carter,\*  
and J.E. Vernet\*

Energy and Environmental Systems Division  
Integrated Assessments and Policy Evaluation Group

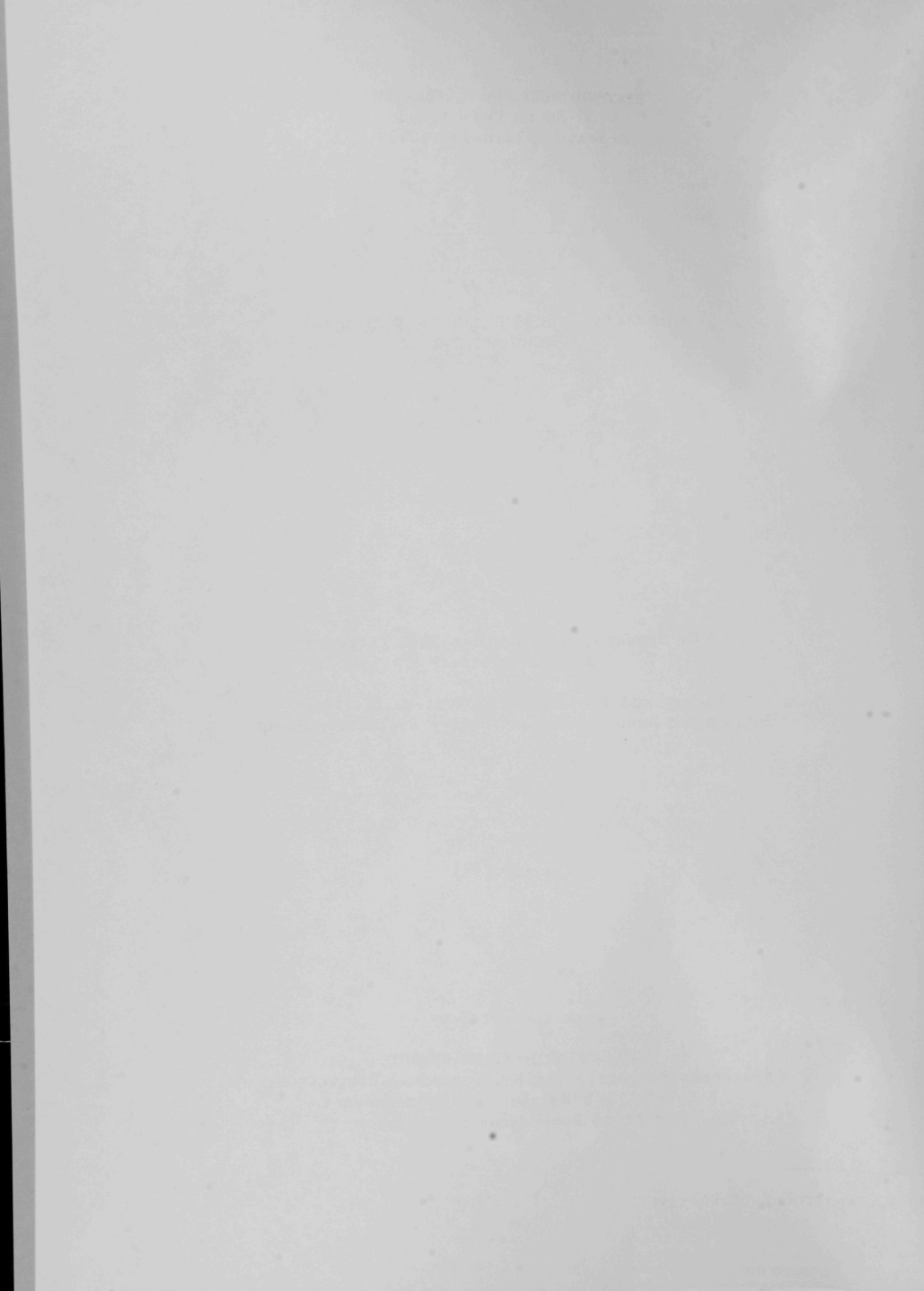
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## PREFACE

This report presents an analysis of bills introduced into the 97th Congress to control acid rain. The report evaluates the state-level reductions in sulfur dioxide required by the bills and estimates the costs of implementing the control strategies. The energy and environmental tradeoffs of all the bills are compared. The project is part of a general program of environmental assessment sponsored by the Office of Environmental Analysis in the Department of Energy (DOE) and performed by the staff of this office and by the Integrated Assessments and Policy Evaluation Group in the Energy and Environmental Systems Division of Argonne National Laboratory. The DOE project officer was Doug Carter.



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ABSTRACT

This report reviews the activities of the 97th Congress of the United States related to the proposed establishment of an acid rain control program for the nation. Fourteen bills were introduced that address acid rain or the long-range transport of air pollutants. This report analyzes the emissions reductions and costs required by the five major bills: Mitchell (S. 1706), Moynihan (S. 1709), D'Amours (H.R. 4816), Moffett (H.R. 4829), and the Senate Committee (S. 3041). The emissions reductions range between 6.5 and 13.6 million tons of sulfur dioxide per year, at a cost of \$2.6-5.4 billion per year. Impacts on specific midwestern states are discussed. In an appendix, the report reproduces copies of the five major bills referred to above.

1 OVERVIEW OF CONGRESSIONAL ACTIVITIES

The 97th Congress of the United States was the scene of considerable activity concerning the proposed establishment of an acid rain control program. Fourteen bills were submitted to the 97th Congress (seven in the House and seven in the Senate) for the purposes of controlling acid rain or related air quality problems. Four of these bills address the Clean Air Act in its entirety; eight bills call for reductions in sulfur dioxide and nitrogen oxide emissions in order to reduce acid rain; five bills call for an acceleration in the existing 10-year acid rain research program; and four bills attempt to strengthen the provisions of Section 126 of the Clean Air Act, which addresses long-range transport of pollution. This report reviews the actions of the 97th Congress and provides a perspective on the changing views of the best approach to this problem. The analytical sections of this report focus on the bills that call for reductions in emissions of sulfur dioxide and nitrogen oxides.

On October 6, 1981, two bills were introduced in the Senate with the purpose of amending the Clean Air Act to control acid precipitation. Sen. George J. Mitchell (D-ME) introduced S. 1706 (for himself and eleven other senators), which, if enacted, would be called the "Acid Deposition

Control Act." Sen. Daniel P. Moynihan (D-NY) introduced S. 1709, which, if enacted, would be called the "Acid Precipitation Control Act of 1981." Both bills call for a reduction in sulfur dioxide emissions in the 31-state region east of and bordering the Mississippi River. Rules are prescribed for determining how these reductions are to be achieved. Table 1 summarizes the contents of S. 1706 ("the Mitchell Bill") and Table 2 summarizes the contents of S. 1709 ("the Moynihan Bill").

On October 7, 1981, Sen. Christopher J. Dodd (D-CT) introduced S. 1718 to amend Secs. 110 and 126 of the Clean Air Act relating to interstate pollution.

On October 22, 1981, three bills were introduced into the House of Representatives with similar purposes to S. 1706 and S. 1709. Rep. Norman E. D'Amours (D-NH) introduced H.R. 4816, and Rep. Toby Moffett (D-CT) introduced H.R. 4829 (for himself and eleven other representatives). Table 3 summarizes the contents of H.R. 4816 ("the D'Amours Bill") and Table 4 summarizes the contents of H.R. 4829 ("the Moffett Bill"). The Moffett Bill is similar but not identical to the Mitchell Bill. Both of these House bills call for reductions in sulfur dioxide emissions according to prescribed rules.

Also introduced on October 22, 1981, was H.R. 4830 by Rep. Judd Gregg (R-NH), for himself and four other representatives. This bill, which, if enacted, would be called the "Acid Rain Research Implementation Act of 1981," is designed to strengthen research and development programs and establish a process for cooperative decisionmaking on acid rain control strategies. No reductions in sulfur dioxide emissions are called for.

On November 10, 1981, Rep. James H. Scheuer (R-NY) introduced H.R. 4936, which is almost identical to the Moynihan Bill, S. 1709. The only difference between the two bills is that Scheuer's bill would allow states eighteen months to amend their implementation plans under Sec. 184, whereas Moynihan's bill would allow the states only twelve months.

On November 19, 1981, Rep. Nick J. Rahall II (D-WV), on behalf of himself and eight other representatives, introduced H.R. 5055 to accelerate the national acid rain research program from ten years to five years. The bill would amend Title VII of the Energy Security Act (PL 96-294). Control techniques for sulfur dioxide and nitrogen oxide emissions would be examined, but immediate reductions in emissions are not called for.

On May 27, 1982, Sen. John C. Danforth (R-MO) introduced S. 2594, which modifies the provisions of the Mitchell Bill in two significant ways. First, it divides the acid rain control region into a 22-state primary region and a 9-state secondary region (comprising the most western and southern of the 31 states in the region). Emission reductions from the primary region would be  $7.5 \times 10^6$  T/y of  $\text{SO}_2$ ; if, after a two-year study, EPA determined that reductions from the secondary region were necessary, then the target reduction would increase by  $2.5 \times 10^6$  T/y. Second, all utilities in the region would be



Table 1 Summary of S. 1706, the Mitchell Bill

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TITLE:	Acid Deposition Control Act.
IMPACT REGION:	31 states east of and bordering the Mississippi River, and the District of Columbia.
REGIONAL EMISSION INCREASE:	None permitted ( $\text{SO}_2$ and $\text{NO}_x$ ) over actual emissions as of 1/1/81; includes all stationary sources.
SOURCE EMISSION INCREASE:	No significant increase permitted ( $\text{SO}_2$ and $\text{NO}_x$ ) from major sources, unless offset elsewhere within the region.
REDUCTION REQUIRED:	10 million tons/year $\text{SO}_2$ from 1980 actual emissions.
SCHEDULE FOR REDUCTION:	Unspecified phases; completion 10 years from enactment.
STATE SHARE OF REDUCTION:	State share equal to ratio of its utility (all) emissions (actual) in excess of 1.2 lb sulfur (sic)/ $10^6$ Btu to region's total utility (all) emissions (actual) in excess of 1.2 lb sulfur (sic)/ $10^6$ Btu.
SOURCE OF REDUCTION:	Unspecified.
REDUCTION APPROACHES PERMITTED:	May be used if enforceable: 1) least emissions dispatch, 2) early retirement, 3) quantifiable reductions for energy conservation investment, and 4) regional trading.
$\text{NO}_x$ CREDITS:	Allowed on basis of 2 units $\text{NO}_x$ for each $\text{SO}_2$ unit, by weight.
STUDIES REQUIRED:	LRTAP study of remaining continental U.S. within 2 years of enactment.
REGULATORY AGENCY DEADLINES:	2 years from enactment: state adoption and submittal to EPA and other states in region. 4 months from submittal: EPA approval.
STATE DEFAULT:	3 years from enactment if state defaults: utility submittal of plans to achieve 1.2 lb/ $10^6$ Btu average.

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Table 2 Summary of S. 1709, the Moynihan Bill

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TITLE:	Acid Precipitation Control Act of 1981.
IMPACT REGION:	31 states east of and bordering the Mississippi River and the District of Columbia.
REGIONAL EMISSION INCREASE:	No provision.
SOURCE EMISSION INCREASE:	No provision.
REGIONAL REDUCTION REQUIRED:	No total regional amount specified; amounts specific to each state.
REDUCTION REQUIRED:	By 12/31/91, the lesser of: 1) 85% of actual SO <sub>2</sub> emissions in 1980 from all non-NSPS utility units emitting >50 kT/year and having 1980 emission rate >3 lb/10 <sup>6</sup> Btu, or 2) Either: a) 50% of lower of actual and allowable SO <sub>2</sub> emissions in 1980 from all utility units >1 MW, where 1980 average statewide utility emission rate <2 lb/10 <sup>6</sup> Btu. b) 75% of lower of actual and allowable SO <sub>2</sub> emissions in 1980 from all utility units >1 MW, where 1980 average statewide utility emission rate >2 lb/10 <sup>6</sup> Btu.
SOURCE OF REDUCTION:	Major stationary sources.
SCHEDULE FOR REDUCTION:	Only final date (12/31/91) specified.
REDUCTION APPROACHES PERMITTED:	1) Trading of offsets within region, 2) early retirement, and 3) energy conservation.
NO <sub>x</sub> CREDITS:	Allowed on basis of 2 units NO <sub>x</sub> for each SO <sub>2</sub> unit.
STUDIES REQUIRED:	No provision.
STATE DEFAULT:	No specific guidance on EPA Administrator's responsibility to promulgate requirements upon state default.

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Table 3 Summary of H.R. 4816, the D'Amours Bill

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TITLE:	Mitigation of Acid Precipitation.
IMPACT REGION:	31 states east of and bordering the Mississippi River.
REGIONAL EMISSION INCREASE:	No provision.
REGIONAL EMISSION REDUCTION:	No total regional amount specified; see state computation under Reduction Required.
REDUCTION REQUIRED:	Each state must reduce, by 1990, SO <sub>2</sub> in amount equal to the sum of: 1) 85% of 1980 level not less than 0.6 lb/10 <sup>6</sup> Btu from those non-NSPS utility plants in states which are the 50 highest 1980 SO <sub>2</sub> utility emitters or 1.2 lb/10 <sup>6</sup> Btu, whichever is lower. 2) Application of 1.2 lb/10 <sup>6</sup> Btu limit to all other non-NSPS utility units >100 MW in state.
SOURCE OF REDUCTION:	Any SO <sub>2</sub> stationary sources.
SCHEDULE FOR REDUCTION:	As if: 1) Schedule for the large units began 2 years from enactment and showed substantial reductions in 1984 and 1987, completed by 1990 2) Schedule for other units began 3 years from enactment and showed substantial improvement in 1984 and 1987, completed by 1990.
REDUCTION APPROACHES PERMITTED:	1) Transferable emission reduction credits within 5 subregions, 2) energy conservation investment reductions, and 3) early retirement.
NO <sub>x</sub> CREDITS:	No provision.
STUDIES REQUIRED:	No provision.
STATE DEFAULT ON SUBMISSION:	Automatic 1.2 lb/10 <sup>6</sup> Btu limit on all non-NSPS utility units >100 MW, to be achieved five years from enactment (State plan required in 16 months).
MISC. REQUIREMENTS:	Continuous monitoring of all utility units >100 MW and all sources where state plan requires reduction.
BASELINE:	Lower of actual or allowable (as of 12/31/80) emissions.

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Table 4 Summary of H.R. 4829, the Moffett Bill

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TITLE:	Acid Deposition Control Act.
IMPACT REGION:	31 states east of and bordering the Mississippi River, and the District of Columbia.
REGIONAL EMISSION INCREASE:	Target SO <sub>2</sub> emissions to be 10 million tons below 1980 level. Growth apparently offset, therefore.
SOURCE EMISSION INCREASE:	No provision.
REDUCTION REQUIRED:	10 million tons/year SO <sub>2</sub> from 1980 actual or allowable emissions (lower).
SCHEDULE FOR REDUCTION:	Phased; reduction beginning 5 years from enactment, substantially complete 8 years from enactment, and completed 10 years from enactment.
STATE SHARE OF REDUCTION:	State share equal to ratio of its 1980 actual utility emissions in excess of 1.2 lb SO <sub>2</sub> /10 <sup>6</sup> Btu to region's total 1980 actual utility emissions in excess of 1.2 lb SO <sub>2</sub> /10 <sup>6</sup> Btu.
SOURCE OF REDUCTION:	Unspecified.
REDUCTION APPROACHES PERMITTED:	If enforceable: 1) least emissions dispatch, 2) early retirement, 3) quantifiable reductions from energy conservation investments, 4) purchase and sale of reduction credits within subregion, 5) precombustion fuel cleaning, 6) fuel switching, 7) FGD, and 8) combustion changes.
NO <sub>x</sub> CREDITS:	Allowed on basis of 2 units NO <sub>x</sub> for each SO <sub>2</sub> unit, by weight.
STUDIES REQUIRED:	LRTAP study of remaining continental U.S. within 2 years of enactment.
STATE DEFAULT:	1) Utility submittal of reduction to a company-wide, within-state 1.2 lb/10 <sup>6</sup> Btu average, on 5/8/10 year schedule; 2) if utility defaults (see 1 above), each unit to comply with 1.2 lb/10 <sup>6</sup> Btu limit 5 years from enactment.

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assessed a levy of 3 mills per kilowatt hour of electricity sold to be paid into an "acid deposition reduction trust fund." These funds would be distributed to offset the costs of achieving the required emission reductions. In all other respects, S. 2594 is identical to S. 1706.

On September 24, 1982, Sen. Jennings Randolph (D-WV) introduced S. 2959, which combines a requirement to accelerate the acid rain research program from ten years to five years with a five-year moratorium on SIP revisions that would result in an increase in sulfur dioxide emissions from existing major stationary sources. The bill would, in addition, authorize EPA to develop and/or implement mitigation strategies such as lake liming to restore acid-altered bodies of water that no longer can support game fish. EPA is authorized to make grants to state or interstate agencies for this purpose, not to exceed 75% of the costs.

These are the major bills which have been introduced into Congress solely for the purposes of controlling or studying acid precipitation. In addition, several bills have been introduced into Congress with the broader goal of amending the Clean Air Act in its entirety. Some of these bills have subsumed one or another of the aforementioned acid rain control bills. The major bills to amend the Clean Air Act are discussed below.

On December 16, 1981, Rep. Thomas A. Luken (D-OH) introduced H.R. 5252 on behalf of himself and five other representatives. This bill did not initially address the acid rain issue, but was amended in the House Committee on Energy and Commerce to include the authority for EPA to provide grants to states to mitigate acid rain damage (e.g., liming of acidified lakes). H.R. 5252 was the markup vehicle in the House Committee, but markup was not completed during the 97th Congress.

On February 22, 1982, Rep. Henry A. Waxman (D-CA) introduced H.R. 5555, another bill to amend the Clean Air Act. This bill does address the acid rain issue and essentially duplicates the Moffett Bill, H.R. 4829, introducing it as a proposed new Sec. 104 of Title I of the Clean Air Act. However, Rep. Waxman was unsuccessful in his attempts to make H.R. 5555 the House markup vehicle.

On March 24, 1982, Sen. Robert C. Byrd (D-WV), on behalf of himself and Sens. Ford and Eagleton, introduced S. 2266, which, if enacted, would be called the "Clean Air Reauthorization and Acid Precipitation Study Act of 1982." This bill would introduce a new Title IV - Acid Precipitation Study - to accelerate the existing research program mandated under the Energy Security Act (PL 96-294). Control techniques for sulfur dioxide emissions would be examined, but no emissions reductions are called for. The provisions of S. 2266 relating to acid rain are the same as the Rahall Bill, H.R. 5055.

The only proposal before the Senate that called for emissions reductions in the context of amendments to the Clean Air Act was the markup document introduced into the Senate Environment and Public Works Committee by

Sen. Robert T. Stafford (R-VT). The markup vehicle essentially subsumed the Mitchell Bill, S. 1706, as a proposed new Part E of Title I of the Clean Air Act. The major difference between the two versions was that the markup vehicle added a two-year period of negotiation among the 31 affected states to determine emission reduction requirements for each state. Seventy-five percent of the states would have to agree to the proposed emissions reduction plan before it would become effective. The markup bill was amended before being reported out of Committee on August 19, 1982, to reduce the emission reduction goal to  $8 \times 10^6$  T/y and to extend the deadline by two years to twelve years. This version was introduced on November 15, 1982, as Senate Bill S. 3041. Table 5 summarizes the contents of S. 3041, which we term "the Committee Bill."



Table 5 Summary of S. 3041, the Committee Bill

TITLE:	Adds Part E - "Interstate Transport and Acid Precursor Reduction" to Title I of the Clean Air Act.
IMPACT REGION:	31 States east of and bordering the Mississippi River, and the District of Columbia.
REGIONAL EMISSION INCREASE:	See SOURCE EMISSION INCREASE below. From 1/1/95, no SO <sub>2</sub> increase permitted; new sources meeting best-in-region BACT are exempt from offset requirements.
SOURCE EMISSION INCREASE:	No increase in actual SO <sub>2</sub> emissions as of 1/1/81, unless offset elsewhere in region; does not apply where the SIP limits all sources to 1.2 lb SO <sub>2</sub> /10 <sup>6</sup> Btu, or to coal conversion emissions >1.5 lb SO <sub>2</sub> /10 <sup>6</sup> Btu. No increase in actual NO <sub>x</sub> emissions as of 1/1/81.
REDUCTION REQUIRED:	8 million tons/year SO <sub>2</sub> from 1980 actual emissions.
SCHEDULE FOR REDUCTION:	By 1/1/93, conventional retrofit technology in operation; by 1/1/95, innovative technology or replacement facility in operation.
STATE SHARE OF REDUCTION:	Governors allowed 18 months to develop allocation plan; failing agreement, state share equal to ratio of its utility (all) emissions (actual) in excess of 1.5 lb SO <sub>2</sub> /10 <sup>6</sup> Btu to region's total utility emissions (actual) in excess of 1.5 lb SO <sub>2</sub> /10 <sup>6</sup> Btu.
SOURCE OF REDUCTION:	Unspecified.
REDUCTION APPROACHES PERMITTED:	May be used if enforceable: 1) least emissions dispatch, 2) early retirement, 3) quantifiable energy conservation investment, and 4) regional trading.
NO <sub>x</sub> CREDITS:	Not permitted.
NONCOMPLYING SOURCES:	Major sources not in SIP compliance in 1981 must be in compliance by 12/31/85 or be subject to 1.2 lb SO <sub>2</sub> /10 <sup>6</sup> Btu emission limitation.
STUDIES REQUIRED:	1) Additional funding for and reports from Interagency Task Force, 2) independent scientific review board established by NAS, 3) EPA and Treasury study of possible utility fee systems to finance emissions reductions, and 4) EPA NO <sub>x</sub> inventory and control technology study.

Table 5 (Cont'd)

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REGULATORY AGENCY  
DEADLINES:

18 months from enactment: Gubernatorial allocation agreement. 42 months from enactment: SIP revision submittals or reductions. 6 months from submittal: EPA approval.

STATE DEFAULT:

Failure to reach gubernatorial agreement: see STATE SHARE OF REDUCTION above. Failure to submit or have approved SIP: 1.2 lb SO<sub>2</sub>/10<sup>6</sup> Btu imposed on all utilities.

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## 2 ANALYSIS OF THE BILLS

In this section, the emissions reductions mandated by the bills are evaluated, and estimates are made of the costs of implementing the control strategies for utility power plants. Only the primary directives of the bills are analyzed; default provisions are not evaluated. Analytically, there are five distinct approaches to reducing emissions: the Mitchell, Moynihan, D'Amours, Moffett, and Committee Bills. These five bills or their relevant parts are reproduced in the appendix. Each of the other acid rain control bills is a variation on one of these five approaches, with no differences in the amounts or locations of pollutant removal required.

Although the prescriptions for calculating emission reductions appear to be quite straightforward, different interpretations are possible in some cases, largely relating to inclusion of SIP compliance and a growth allowance. Three kinds of uncertainties exist: ambiguous language in the bills, absence of clarifying provisions in the bills, and discrepancies between the bills as written and the intentions of the sponsors as expressed at subsequent Congressional hearings. For these reasons, several versions of some of the bills have been analyzed in this report. In presenting summary tables and figures, two versions are given for some of the bills: a literal reading of the language in the bill as printed and a best interpretation of the intention of the bill's sponsor. In addition, tabular data are presented so that the reader can calculate different combinations of growth and SIP compliance if he or she disagrees with the interpretation in the text.

State Implementation Plan (SIP) noncompliance presents a particular problem. Certain bills ignore noncompliance completely; other bills require the prescribed reductions to be applied in addition to reductions mandated by existing regulations. Whether or not to attribute reduction down to SIP levels to the acid rain bills or to the SIPs themselves is not obvious. In the absence of the acid rain bills, it is quite possible that noncompliance would persist or that SIPs might be relaxed to allow existing emission rates to continue. Likewise, regional emissions ceilings such as are contained in the acid rain bills would preclude SIP relaxation for plants currently in compliance. For summary purposes, in Sec. 3, it is assumed that reduction to SIP allowable levels would not necessarily occur in the absence of the bills, and therefore reductions needed to meet SIPs are attributed to the bills. In Sec. 2, reductions are presented for both assumptions.

Some of the bills call for additional growth in emissions of sulfur dioxide and/or nitrogen oxides during the period of the program to be offset when emissions reductions are determined. In this analysis, reduction in emissions necessary to offset new growth is calculated in terms of sulfur dioxide reduction only.

All of the bills call for reductions at the state level to be calculated on the basis of existing power plant emissions; however, it is not

necessarily required that the reductions be achieved by controlling power plants alone. Only where a state fails to submit an adequate control plan are the reductions specifically required to be obtained through decreases in utility power plant emissions. Nevertheless, because it is expected that the large majority of the reductions will be obtained at power plants, this is the approach taken in the present analysis. For the purposes of this report, the significance of this assumption is that it may affect the cost estimates projected, but not the emission reductions required. Certain states with significant oil-fired capacity might find cheaper ways to reduce emissions than are suggested in this analysis. Likewise, alternative strategies such as least emissions dispatch, energy conservation, regional trading, etc., are not examined. Neither are strategies to reduce emissions from industrial boilers or processes examined.

The data bases used in this analysis come from two primary sources:

- The EPA power plant "unit inventory" file created by E.H. Pechan & Associates from DOE and EPA data sources;<sup>1</sup> and
- An SO<sub>2</sub> and NO<sub>x</sub> growth file created from the June 1982 final report by Work Group 3-B (WG 3-B), of the U.S./Canada transboundary air pollution negotiation group.<sup>2</sup>

The EPA unit inventory contains data on over 75 variables for every electricity generating unit (not plant) in the U.S. Data on units under 25 MW capacity are generally combined into an aggregate entry for each state, by fuel category. Variables in the data set include information quantifying fuel use and sulfur content, as well as installed pollution control hardware. It is generally believed at EPA and DOE that this file contains the best available estimates of utility sulfur dioxide emissions for 1980.

However, because much of the fuel use data is reported by utilities at the plant level rather than unit level, emission estimates below the plant level generally reflect assumptions that each unit at the plant burns the same sulfur-content fuel. Such is often not the case, especially where some units at a facility are subject to NSPS requirements, while others are subject only to SIP regulations. Therefore, the data base can lead to erroneous conclusions when judging regulatory compliance at the unit level. For this reason, the legislative analysis was carried out at the plant level, with only one exception. The exception occurs when identifying units subject to NSPS. Several of the bills specify that NSPS units are to be excluded from certain calculations, such as determining a state's average SO<sub>2</sub> emission rate from power plants. In these cases it was necessary to use unit-level information to screen these units from the calculation.

The only modification made to the basic unit inventory database involved designation of NSPS units. The unit inventory took this data from

DOE/FERC Form 67 files, and these are somewhat ambiguous on the point of regulatory category. For example, if the utility references 40CFR60 when completing the form it is clearly identifying the unit as subject to NSPS, since this is the NSPS regulatory citation. However, if a state has been delegated responsibility for regulating new sources, a state regulation will probably be cited on the form. It is not evident without further research that such a source is subject to NSPS-equivalent requirements. Changes made in the unit inventory include a small number of units identified as subject to SIP regulation being redesignated as NSPS units, based on the stringency of the state requirement and the start-up date of the unit.

Several of the bills analyzed require emission increases from new sources to be offset by additional reductions from existing plants. It is therefore necessary to project future emissions for all sources and compare this estimate to estimates of existing emissions of  $\text{NO}_x$  and  $\text{SO}_2$ . Pursuant to an August 5, 1980, Memorandum of Intent, signed by the U.S. and Canada, working groups have been created to address questions related to transboundary air pollution. The work group on Emissions, Cost, and Engineering Assessment (WG 3-B) developed data for 1980, 1990, and 2000 for  $\text{SO}_2$  and  $\text{NO}_x$ . These data were used to project emissions growth on a state level.

The treatment of control costs is unsophisticated. The degree of sophistication adopted, however, is felt to be appropriate for this analysis; it is very difficult to determine with any greater confidence the actual costs that would be incurred in achieving these large levels of reduction. Previous studies performed for DOE, EPA and ANL by Teknekron Research, Inc., and ICF, Inc., have indicated that  $\text{SO}_2$  reductions in the East of 10-30% can be achieved at a cost of \$200-\$500 per ton of  $\text{SO}_2$  removed. It is likely that the degree of reduction proposed by these bills would result in costs at the upper end of this range. However, it is impossible to be very precise when the sources of the reduction are unknown and the potential reduction strategies are so numerous. We have chosen a constant cost-effectiveness figure of \$400 per ton of  $\text{SO}_2$  removed for each scenario and for each state. It is considered that this figure gives a reasonable estimate of the costs that would be incurred and is adequate for comparing the costs of these bills with the costs of other air quality initiatives. Where the report specifies a range of costs for a bill, this range is based on a range of interpretations of the bill, and does not reflect uncertainty in the cost figure of \$400/ton  $\text{SO}_2$  removed. Hence the range is not a range of possible costs, but a distribution of several possible independent estimates.

Table 6 shows the actual  $\text{SO}_2$  emissions in 1980 and the projected growth in  $\text{SO}_2$  and  $\text{NO}_x$  emissions through the year 2000 for those states in the acid rain control region. The actual utility  $\text{SO}_2$  emissions in 1980 were  $15.9 \times 10^6$  T/y, concentrated largely in Ohio, Indiana, Pennsylvania, Missouri, and Illinois. Figure 1 shows the state-level distribution of current (1980) utility emissions. Bills requiring reductions in the range of 8-12 million tons per year are clearly calling for a high level of reduction in regional emissions, averaging considerably greater than 50% reduction.

Table 6 Current and Projected Emissions in the Acid Rain Control Region

	Actual Utility SO <sub>2</sub> Emissions in 1980 (10 <sup>3</sup> T/y)	Growth in SO <sub>2</sub> Emissions from All Sources (10 <sup>3</sup> T/y)	Growth in SO <sub>2</sub> Emissions from Station- ary Sources (10 <sup>3</sup> T/y)	Growth in NO <sub>x</sub> Emissions from Station- ary Sources (10 <sup>3</sup> T/y)
Alabama	529	112	108	120
Arkansas	23	156	154	95
Connecticut	32	41	32	35
Dist. of Col.	4	3	1 <sup>a</sup>	1
Delaware	59	-37	-37	18
Florida	705	109	105	270
Georgia	735	272	262	210
Iowa	226	112	108	52
Illinois	1,115	374	356	298
Indiana	1,522	-392	-404	92
Kentucky	1,057	-250	-253	89
Louisiana	23	527	541 <sup>a</sup>	-153
Massachusetts	202	-79	-94	80
Maryland	221	121	116	88
Maine	1	-1	-2	44
Michigan	547	206	185	211
Minnesota	155	59	54	84
Missouri	1,131	51	43	33
Mississippi	134	-17	-9	-40
N. Carolina	426	234	226	162
N. Hampshire	80	2	0 <sup>a</sup>	19
N. Jersey	95	231	215	177
New York	445	-129	-143	103
Ohio	2,240	14	-11	416
Pennsylvania	1,448	69	50	186
Rhode Island	5	8	6	8
S. Carolina	214	177	175	81
Tennessee	933	22	13	46
Virginia	159	40	37	39
Vermont	0	4	3	10
Wisconsin	476	-43	-50	204
W. Virginia	967	149	146	197
Total	15,908	2,146	1,932	3,274

<sup>a</sup>Exempt from offset in the Committee Bill.

Source: Ref. 2.



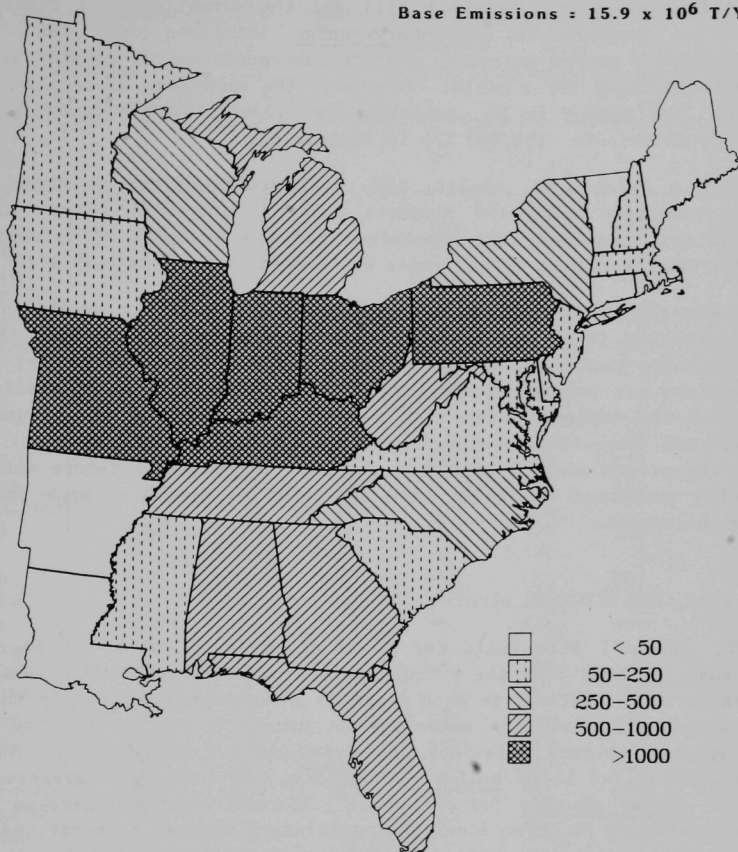
Base Emissions :  $15.9 \times 10^6$  T/Y

Fig. 1 State-Level Distribution of Actual 1980 Utility Emissions  
( $10^3$  T/y)

The growth in  $\text{SO}_2$  emissions from all sources between 1980 and 2000 is projected<sup>2</sup> to be  $2.15 \times 10^6$  T/y in this region. This growth factor is appropriate for use in analyzing bills such as the Moffett Bill, which simply require no increase in regional  $\text{SO}_2$  emissions over 1980 levels. In this case, projected growth ranges from a maximum state-level increase of 527,000 T/y in Louisiana (due to extensive switching from oil and gas to coal) to a maximum decrease of 392,000 T/y in Indiana (due to cleanup or retirement of existing steel and utility plants). This report does not "regionalize" the growth, but "charges" each state its own growth (or "credits" reductions).

Bills such as the Mitchell Bill and the Committee Bill require that there be no increase in stationary-source emissions over 1980 levels; therefore, mobile source emissions must be subtracted out in considerations of growth offsets under these bills. Growth in  $\text{SO}_2$  emissions is reduced to  $1.93 \times 10^6$  T/y, and growth in  $\text{NO}_x$  emissions is  $3.27 \times 10^6$  T/y (ranging from + 416,000 T/y in Ohio to -153,000 T/y in Louisiana).

With a 2-for-1  $\text{NO}_x$  credit, the total growth offset in terms of  $\text{SO}_2$  emissions reduction under the Mitchell Bill is  $3.57 \times 10^6$  T/y. With the exemptions for Louisiana, New Hampshire, and the District of Columbia (see Sec. 2.5), the  $\text{SO}_2$  growth offset under the Committee Bill is  $1.39 \times 10^6$  T/y.

These growth numbers must be acknowledged as highly uncertain. The factors affecting industrial growth and environmental control over the next twenty years are simply impossible to predict with any great accuracy. States like Louisiana and Indiana, where large changes in emissions are predicted as a result of the implementation of federal or local energy or environmental policies, are especially vulnerable to predictive uncertainty. Hence, although the growth numbers represent the current wisdom on future emissions, the results presented for bills with inclusion of growth offsets should be viewed with caution.

## 2.1 S. 1706, THE MITCHELL BILL

The Mitchell Bill calls for a reduction in emissions of  $\text{SO}_2$  of ten million tons per year from the actual level of emissions in 1980. This total reduction is to be achieved in each state in amounts proportional to the ratio of the actual state utility emissions in excess of  $1.2 \text{ lb}/10^6 \text{ Btu}$  to the actual regional utility emissions in excess of  $1.2 \text{ lb}/10^6 \text{ Btu}$ . The bill itself specifies  $1.2 \text{ lb}$  of sulfur per  $10^6 \text{ Btu}$ , but this is interpreted to be  $1.2 \text{ lb}$  of sulfur dioxide per  $10^6 \text{ Btu}$ . In addition, no increase in the emissions of  $\text{SO}_2$  or  $\text{NO}_x$  from individual stationary sources is permitted beyond the total actual emission levels as of January 1, 1981. This provision and the  $10 \times 10^6$  T/y reduction target are interpreted to mean that growth in emissions of these two pollutants from stationary sources over the ten-year period must be offset by further emissions reductions, although it is not clear that this was intended by Sen. Mitchell. No reference is made to existing sources currently not in compliance with SIPs, so it is likely that emissions reductions should properly be calculated in relation to actual emissions; however, it is also possible that an allowance should be made for emissions needed to bring sources into compliance and that these emissions reductions should not be attributed to the Mitchell Bill. Table 7 lists the specified emissions reductions with and without reductions associated with a growth offset and SIP compliance. Costs are also included, with a control cost of \$400 per ton of  $\text{SO}_2$  removed being assumed.

The base reduction of 10 million tons per year is allocated primarily to states with emission limits in excess of  $1.2 \text{ lb}/10^6 \text{ Btu}$ , as would be

Table 7 Emissions Reductions and Costs of the Mitchell Bill

	Emissions Reduction ( $10^3$ tpy)				Cost (\$ $10^6$ /yr)			
	A	B	C	D	A	B	C	D
Alabama	268	436	262	430	107	174	105	172
Arkansas	2	203	-2	199	1	81	-1	80
Connecticut	0	50	0	49	0	20	0	20
Dist. of Col.	0	2	0	2	0	1	0	1
Delaware	25	-4	-2	-31	10	-2	-1	-12
Florida	336	575	336	575	134	230	134	230
Georgia	457	824	431	798	183	330	172	319
Iowa	125	259	125	259	50	104	50	104
Illinois	758	1,263	718	1,224	303	505	287	490
Indiana	1,168	810	1,117	760	467	324	447	304
Kentucky	767	559	399	191	307	224	160	76
Louisiana	0	465	0	465	0	186	0	186
Massachusetts	71	18	15	-39	28	7	6	-16
Maryland	109	269	100	260	44	108	40	104
Maine	1	21	1	21	0	8	0	8
Michigan	227	518	227	517	91	207	91	207
Minnesota	56	152	56	152	22	61	22	61
Missouri	903	962	903	962	361	385	361	385
Mississippi	76	47	71	43	30	19	28	17
N. Carolina	86	392	86	392	34	157	34	157
N. Hampshire	50	59	50	59	20	24	20	24
N. Jersey	36	339	36	339	14	136	14	136
New York	219	128	217	125	88	51	87	50
Ohio	1,688	1,885	1,515	1,712	675	754	606	685
Pennsylvania	852	994	723	866	341	398	289	346
Rhode Island	0	9	0	9	0	4	0	4
S. Carolina	95	311	94	310	38	124	38	124
Tennessee	671	708	495	531	268	283	198	212
Virginia	26	83	21	78	10	33	8	31
Vermont	0	8	0	8	0	3	0	3
Wisconsin	340	393	307	359	136	157	123	144
W. Virginia	589	833	568	812	236	333	227	325
Total	10,000	13,568	8,867	12,436	4,000	5,427	3,547	4,974

A: Base reduction of  $10 \times 10^6$  tons/yr.

B: Base reduction with growth offset.

C: Base reduction with SIP allowance subtracted.

D: Base reduction with growth offset and SIP allowance.

expected from the legislative formula for determining state shares. Ohio, Indiana, Missouri, Pennsylvania, and Kentucky -- in that order -- are targeted for the largest reductions. In the 31-state region, a reduction of 63% from 1980 actual SO<sub>2</sub> utility emissions would be required. If growth is required to be offset, an additional  $3.6 \times 10^6$  tons per year of SO<sub>2</sub> would need to be removed. Ohio, Illinois, Pennsylvania, Missouri, and West Virginia would then be the five states targeted for the largest reductions.

Five states are significantly affected by the SIP reduction allowance: Kentucky, Tennessee, Ohio, Pennsylvania, and Massachusetts. In these states, the difference between allowable and actual emissions is greatest, and the reductions attributable to the Mitchell Bill are correspondingly reduced the most. In the 31-state region, the difference between actual and allowable emissions is approximately 1.1 million tons per year. In Delaware, the reduction necessary to achieve SIP levels is greater than the reduction required by the Mitchell Bill. After new growth is factored in, both Delaware and Massachusetts yield negative values of the reduction required (see Table 7). This is a previously unforeseen consequence of the reduction formula, which could potentially benefit those states through interstate trading.

If it is determined that both a growth offset and an SIP allowance are appropriate, then the overall reduction required by the Mitchell Bill is  $12.4 \times 10^6$  tons per year, concentrated in Ohio, Illinois, Missouri, Pennsylvania, and West Virginia.

The range of emissions reductions under the Mitchell Bill is therefore  $8.8\text{--}13.6 \times 10^6$  tons per year, depending on interpretation of the language of the bill, with costs in the range of  $\$3.5\text{--}\$5.4 \times 10^9$  per year. Other cost estimates for the Mitchell Bill, made by the bill's sponsors and OTA range from  $\$2.8\text{--}\$4.1 \times 10^9$  per year.<sup>3,4</sup> In the most heavily affected state, Ohio, costs are estimated to be in the range of  $\$600\text{--}\$750 \times 10^6$  per year. For this bill, Case B represents a literal reading of the bill -- reductions from actual levels, inclusive of reductions necessary to achieve SIP compliance, but with a growth offset; Case D probably represents a best interpretation of Congressional intent, in which the Mitchell Bill reductions do not include reductions necessary to meet allowable SIP levels. Figures 2 and 3 show the state-level distributions of emission reductions required for Cases B and D.

## 2.2 S. 1709, THE MOYNIHAN BILL (also the Scheuer Bill)

The approach of the Moynihan Bill to determining emissions reductions is based largely on a percentage removal requirement (equivalent to FGD performance) for major emitting sources, rather than a target of a specified total reduction in emissions. The provisions of the Moynihan Bill are quite complex, but subject to only one gray area of interpretation.

The basic requirement is for an emissions reduction equivalent to an 85% reduction in the actual 1980 sulfur dioxide emissions from all non-NSPS

Base Reduction :  $10.0 \times 10^6$  T/Y  
New Growth :  $3.6 \times 10^6$  T/Y  
Total Reduction :  $13.6 \times 10^6$  T/Y  
(SIP allowance not included)

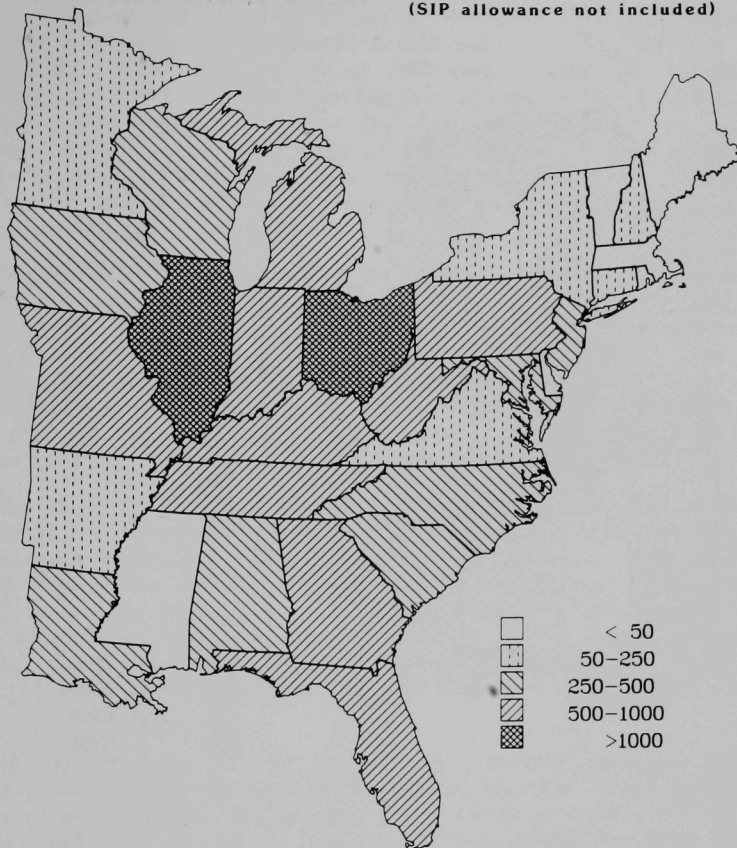


Fig. 2 State-Level Distribution of Emission Reductions Required by the Mitchell Bill (Literal Reading)

Base Reduction :  $10.0 \times 10^6$  T/Y  
 New Growth :  $3.6 \times 10^6$  T/Y  
 SIP Allowance :  $-1.1 \times 10^6$  T/Y  
 Total Reduction :  $12.4 \times 10^6$  T/Y

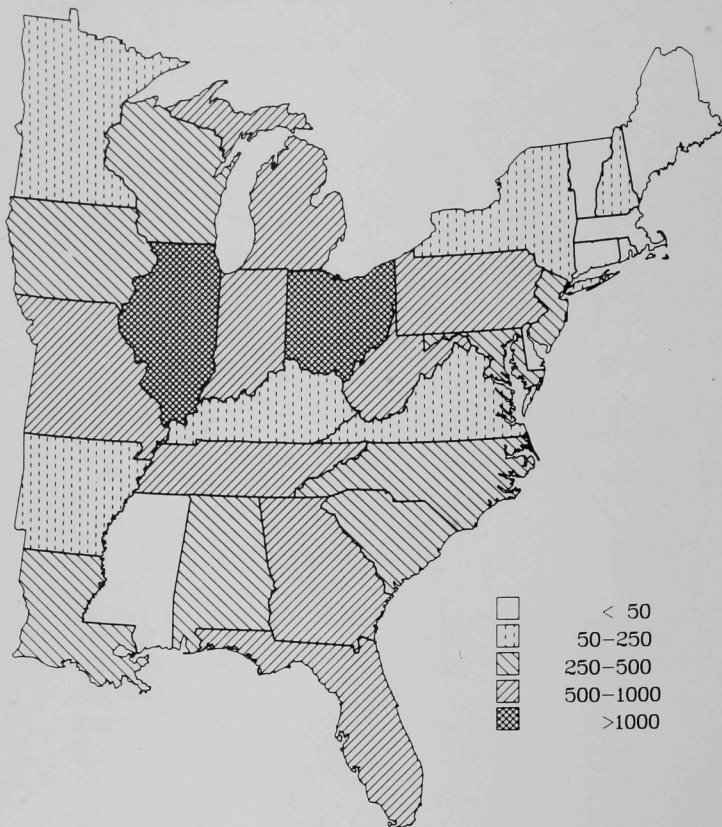


Fig. 3 State-Level Distribution of Emission Reductions Required by the Mitchell Bill (Best Interpretation of Congressional Intent)



power plants in the 31-state region which had 1980 actual emissions greater than 50,000 tons of  $\text{SO}_2$  and a 1980 actual emission rate greater than 3 lb  $\text{SO}_2/10^6$  Btu. The amount of the reduction in any state, however, is not required to exceed 50% of the 1980 actual emissions from all power plants larger than 1 MW where the statewide actual emissions rate is less than or equal to 2 lb  $\text{SO}_2/10^6$  Btu, or 75% of 1980 emissions if the statewide rate exceeds 2 lb  $\text{SO}_2/10^6$  Btu. This limiting provision is modified in Sec. 183(b) by excluding emissions in excess of the SIP allowable emissions. Thus the provision should be analyzed in terms of 50% (75%) of the lower of actual and allowable emissions. In no state does the 50%/75% criterion dominate over the 85% criterion, so the 50%/75% provision is largely superfluous. Only in Tennessee are the numbers comparable.

Section 183(b) of the Moynihan Bill excludes emissions in excess of the allowable SIP emissions when determining base year emissions for the purpose of Section 183(a) dealing with the 85% and 50%/75% reduction requirements. However, the wording of Sec. 183(b) seems to apply primarily to the 50%/75% provisions, and not clearly to the 85% provision; but there is no obvious reason why the two should be treated differently. In this analysis, it is assumed that 85% reduction in actual emissions is intended. Table 8 lists the emissions reductions and costs associated with the Moynihan Bill.

The first observation on the effects of the Moynihan Bill is that only 16 of the 31 states are required to control emissions at all. New England and Atlantic Coast states are largely unaffected by the bill. This arises from the 3 lb  $\text{SO}_2/10^6$  Btu cut-off in plants subject to control. Ohio, Missouri, Indiana, Tennessee, and Illinois -- in that order -- are targeted for the largest reductions under the Moynihan Bill if 85% of actual emissions is intended. The total reduction would be  $6.5 \times 10^6$  tons per year, at a cost of  $\$2.6 \times 10^9$  per year. Other cost estimates range between  $\$2$ - $2.6 \times 10^9$  per year.<sup>5</sup>

If the Moynihan Bill is intended to prescribe emissions reductions required in addition to SIP compliance amounts, then the actual reductions to be achieved by the states are greater by the amount of  $1.13 \times 10^6$  T/y. Then the total reduction is  $7.6 \times 10^6$  T/y -- concentrated in Ohio, Kentucky, Indiana, Tennessee, and Missouri -- at a cost of  $\$3.1 \times 10^9$  per year. Figures 4 and 5 illustrate the emissions reductions required by the Moynihan Bill (Case D = literal interpretation; Case C = best interpretation of Congressional intent).

## 2.3 H.R. 4816, THE D'AMOURS BILL

The D'Amours Bill is similar to the Moynihan Bill in that it does not target a total level of emission reduction, but rather specifies a reduction based on a percentage decrease in the emissions from certain sources. It differs from the Moynihan Bill in that it addresses those sources with the largest actual emissions, rather than those with high emission rates.

Table 8 Emissions Reductions and Costs of the Moynihan Bill

	Emissions ( $10^3$ t/y)				Cost ( $\$10^6$ /yr)	
	A	B	C	D	C	D
Alabama	126	397	107	113	43	45
Arkansas	0	12	0	4	0	2
Connecticut	0	16	0	0	0	0
Dist. of Col.	0	2	0	0	0	0
Delaware	0	30	0	27	0	11
Florida	301	354	256	256	102	102
Georgia	210	554	178	204	71	82
Iowa	0	172	0	0	0	0
Illinois	702	836	597	636	239	254
Indiana	933	1144	793	844	317	338
Kentucky	575	793	489	857	196	343
Louisiana	0	11	0	0	0	0
Massachusetts	0	101	0	57	0	23
Maryland	0	166	0	9	0	4
Maine	0	3	0	0	0	0
Michigan	54	275	46	46	18	18
Minnesota	0	77	0	0	0	0
Missouri	934	849	794	794	318	318
Mississippi	66	70	56	60	22	24
N. Carolina	0	213	0	0	0	0
N. Hampshire	52	60	45	45	18	18
N. Jersey	0	48	0	0	0	0
New York	52	222	44	47	18	19
Ohio	1,407	1,680	1,196	1,370	478	548
Pennsylvania	683	1,086	580	709	232	284
Rhode Island	0	3	0	0	0	0
S. Carolina	0	162	0	1	0	0
Tennessee	783	699	666	843	266	337
Virginia	0	80	0	5	0	2
Vermont	0	3	0	0	0	0
Wisconsin	134	357	113	147	45	59
W. Virginia	630	725	535	556	214	222
Total	7,644	11,957	6,497	7,630	2,599	3,052

A: Emissions from all non-NSPS plants with 1980 emissions greater than 50,000 tons per year and an actual emission rate greater than  $3 \text{ lb}/10^6 \text{ Btu}$ .

B: Emissions under the 50%/75% requirement.

C: Base reduction of the Moynihan Bill (85% of A; and not greater than B).

D: Base reduction of the Moynihan Bill with a SIP allowance added.

Base Reduction =  $6.5 \times 10^6$  T/Y  
 SIP Allowance =  $1.1 \times 10^6$  T/Y  
 Total Reduction =  $7.6 \times 10^6$  T/Y  
 (growth offset not included)

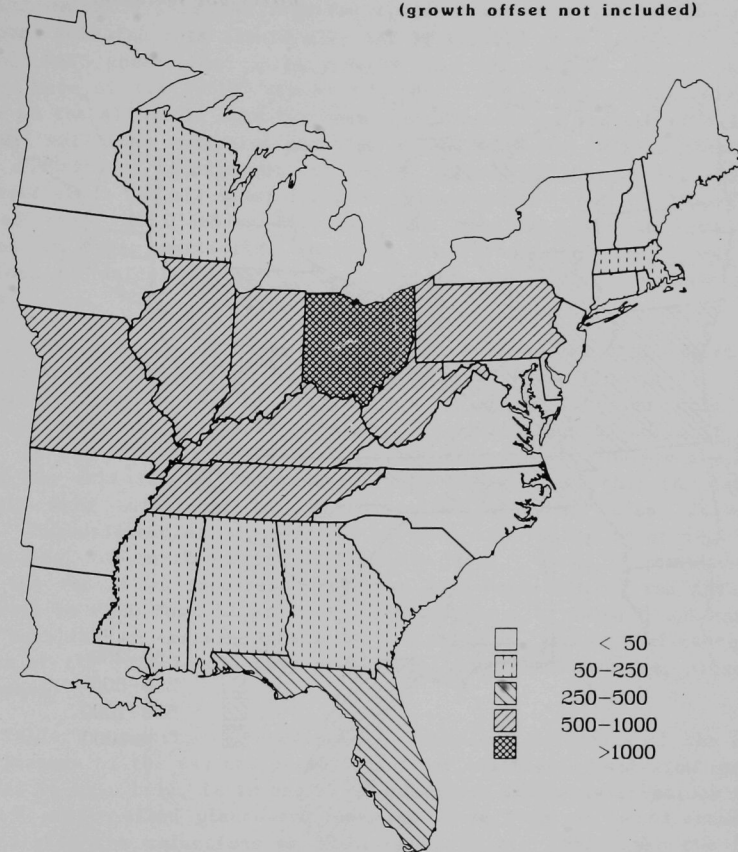


Fig. 4 State-Level Distribution of Emission Reductions  
 Required by the Moynihan Bill (Literal Reading)

Base Reduction =  $6.5 \times 10^6$  T/Y  
 Total Reduction =  $6.5 \times 10^6$  T/Y

(SIP allowance and growth  
 offset not included)

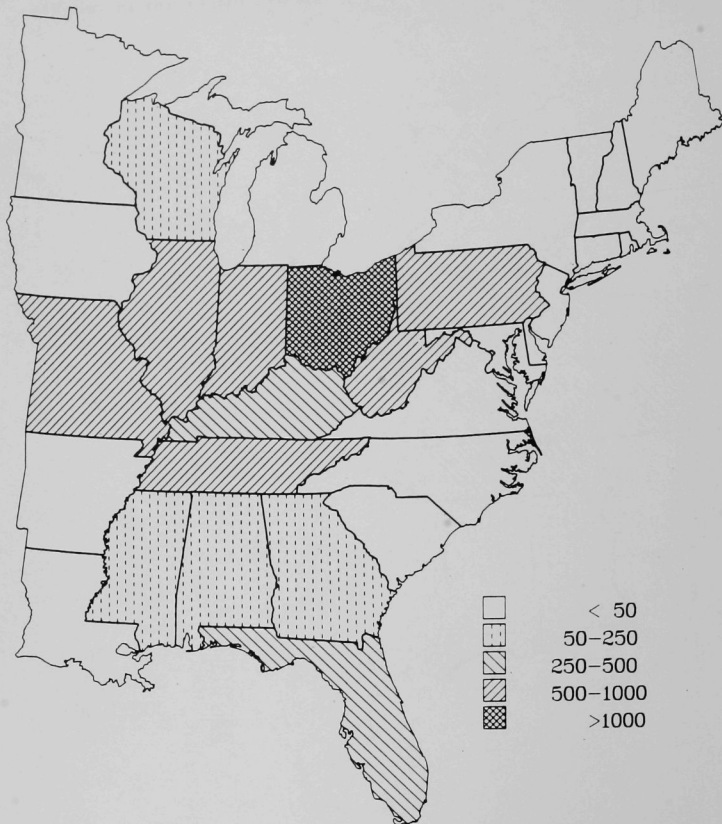


Fig. 5 State-Level Distribution of Emission Reductions  
 Required by the Moynihan Bill (Best Interpretation  
 of Congressional Intent)

The D'Amours Bill calculates the reduction on the basis of an 85% reduction in the lesser of actual and allowable 1980 emissions from the 50 non-NSPS power plant units with the highest  $\text{SO}_2$  emissions in 1980, with the resulting emission rate not required to be lower than  $0.6 \text{ lb}/10^6 \text{ Btu}$ . The unit-level emission rate should also not be greater than  $1.2 \text{ lb}/10^6 \text{ Btu}$ . All other non-NSPS power-plant units greater than 100 MW must achieve an average emission rate of  $1.2 \text{ lb}/10^6 \text{ Btu}$  by the year 1990. This is interpreted as a ceiling on the allowable rate for each plant and not an average of all plants. The total emissions reduction mandated by the D'Amours Bill is therefore the sum of a stringent requirement for the 50 largest emitters and a less stringent requirement for all other SIP power plants larger than 100 MW. It should be noted that the D'Amours Bill does not require that the reductions be obtained at these particular sources, but rather that the amount of the reductions be calculated as if the reduction was to be obtained at these sources.

In defining the 50 largest emitters, the D'Amours Bill refers to "the fifty electric utility steam generating units..." (emphasis added). There is uncertainty, however, as to whether Rep. D'Amours intended this to mean individual units or individual plants (i.e., collections of units at the same site). In the course of this analysis, we attempted to analyze the D'Amours Bill at the unit level. Unfortunately, it became clear that the data bases available were unreliable in the matter of regulatory class at the unit level. Inconsistencies were found between fuel sulfur content, SIP/NSPS designations, and on-line dates at the unit level. These inconsistencies are either the result of incorrect reporting or translation of the data at the unit level in FERC Form 67 or due to the existence of largely unacknowledged plant "bubbles" at certain locations. Because we lacked confidence in the analysis at the unit level, only plant-level interpretations are presented in this report.

Table 9 summarizes the emissions reductions and costs of the D'Amours Bill. Because of the way the prescription for calculating emission reductions is worded in this bill, it is easier to calculate allowable emissions from the large and medium-sized plants and subtract these from the total actual emissions to give the reductions mandated by the bill. Note that the D'Amours Bill addresses only "units...which are not subject to standards of performance under Section 111" [Secs. 182 (1) and (2)]; that is to say, the bill only covers SIP units. Actual emissions from SIP units in the region are  $14.3 \times 10^6 \text{ T/y}$ , compared to total regional utility emissions of  $15.9 \times 10^6 \text{ T/y}$ .

The 50 largest emitting plants are distributed among 14 states, chiefly in the Midwest and South. Applying an 85% reduction in the emissions from these plants, with a  $0.6 \text{ lb}/10^6 \text{ Btu}$  floor and a  $1.2 \text{ lb}/10^6 \text{ Btu}$  ceiling, results in permissible emissions of  $1.37 \times 10^6 \text{ T/y}$ . A ceiling of  $1.2 \text{ lb}/10^6 \text{ Btu}$  on other SIP plants larger than 100 MW results in permissible emissions of  $2.99 \times 10^6 \text{ T/y}$  from all but the top 50 emitters. Combining these permissible emissions and subtracting them from the total actual SIP emissions yields a

Table 9 Emissions Reductions and Costs of the D'Amours Bill

	Emissions Reduction ( $10^3$ T/yr)					Cost ( $\$10^6$ /yr)	
	A	B	C	D	E	D	E
Alabama	446	41	151	254	250	102	100
Arkansas	16	0	12	4	0	2	0
Connecticut	32	0	31	1	1	0	0
Dist. of Col.	4	0	4	0	0	0	0
Delaware	54	0	24	30	1	12	0
Florida	589	23	254	312	312	125	125
Georgia	676	87	109	481	456	192	182
Iowa	180	0	45	135	135	54	54
Illinois	1,057	105	200	752	726	301	290
Indiana	1,210	90	188	933	882	373	353
Kentucky	860	57	165	638	394	255	158
Louisiana	9	0	9	0	0	0	0
Massachusetts	123	0	51	71	15	28	6
Maryland	192	19	63	110	96	44	38
Maine	4	0	0	4	4	2	2
Michigan	511	49	199	263	263	105	105
Minnesota	121	0	63	58	58	23	23
Missouri	1,116	114	91	910	910	364	364
Mississippi	76	0	24	51	51	20	20
N. Carolina	408	67	193	148	148	59	59
N. Hampshire	80	0	33	47	47	19	19
N. Jersey	96	0	62	34	34	14	14
New York	366	0	180	186	182	74	73
Ohio	2,094	270	166	1,657	1,515	663	606
Pennsylvania	1,324	164	179	981	847	392	339
Rhode Island	6	0	2	4	4	2	2
S. Carolina	210	0	113	96	95	38	38
Tennessee	933	115	93	725	548	290	219
Virginia	135	0	116	19	14	8	6
Vermont	3	0	0	3	3	1	1
Wisconsin	422	0	109	314	280	126	112
W. Virginia	924	169	66	689	681	276	272
Total	14,274	1,368	2,994	9,912	8,951	3,965	3,581

A: Actual emissions from SIP plants.

B: Permissible emissions from the 50 largest emitters.

C: Permissible emissions from the remaining SIP plants.

D: Emission reduction required by the D'Amours Bill.

E: Emission reduction required by the D'Amours Bill with a SIP allowance subtracted.



reduction required by the D'Amours Bill of  $9.9 \times 10^6$  T/y. The estimated cost is  $\$4.0 \times 10^9$  per year. The emissions reductions required are greatest in Ohio, Pennsylvania, Indiana, Missouri, and Illinois. Figure 6 shows the state-level distribution of emission reductions required by the D'Amours Bill. This version is a literal reading of the bill.

The total reduction of  $9.9 \times 10^6$  T/y is the difference between actual emissions and permissible emission levels under the bill; in this case, therefore, reductions necessary to comply with SIP requirements are included in the total reduction. If reductions down to SIP levels are not to be counted against the bill, then they must be subtracted from the total reduction. Reductions necessary to achieve SIP allowable levels for SIP-labelled plants are actually only  $0.96 \times 10^6$  T/y, rather than  $1.13 \times 10^6$  T/y for the total set of plants -- the small difference possibly arising from data-base inconsistencies. Thus the D'Amours reduction without inclusion of an SIP allowance is  $9.0 \times 10^6$  T/y, at a cost of  $\$3.6 \times 10^9$  per year. Figure 7 shows the state-level distribution of this reduction. This is interpreted to be the intent of the bill's sponsor.

#### 2.4 H.R. 4829, THE MOFFETT BILL (also the Waxman Bill)

The Moffett Bill is similar to the Mitchell Bill in that it calls for a base reduction in sulfur dioxide emissions of 10 million tons per year. In contrast to the Mitchell Bill, however, the Moffett Bill specifically addresses the question of emissions in excess of SIP allowable levels, by requiring that the 10 million tons reduction be achieved relative to a baseline which is the lower of actual and allowable emissions. Emissions reductions necessary under the Moffett Bill should therefore include the sum of the base reduction and the reduction necessary to achieve SIP levels. The bill specifically addresses growth in Sec. 183(a), requiring that the emission reduction target be sufficient "to achieve an annual average emission level which is 10 million tons of sulfur dioxide per year below the 1980 baseline level." This is interpreted to mean that growth in  $\text{SO}_2$  emissions over the 10-year period must be offset (but see below). Note that the growth allowance under the Moffett Bill ( $2.1 \times 10^6$  T/y) is less than for the Mitchell Bill ( $3.6 \times 10^6$  T/y), because the former applies to  $\text{SO}_2$  growth and the latter applies to both  $\text{SO}_2$  and  $\text{NO}_x$  growth.

A complication arises in consideration of the Moffett Bill, regarding the manner of determining state shares of the emission reduction. Section 183(c) prescribes that state shares be determined in proportion to the ratio of the "excess amount" of emissions in a state to the total of the "excess amounts" for all states in the region. "Excess amount" is defined as those actual 1980 emissions from units in the state which were emitting at a rate in excess of  $1.2 \text{ lb SO}_2/10^6 \text{ Btu}$ . However, it is believed that Rep. Moffett intended excess emissions to mean only that fraction of a plant's emissions in excess of  $1.2 \text{ lb SO}_2/10^6 \text{ Btu}$ , as per the Mitchell Bill. In this analysis,

Base Reduction :  $9.9 \times 10^6$  T/Y  
Total Reduction :  $9.9 \times 10^6$  T/Y  
(SIP allowance and growth  
offset not included)

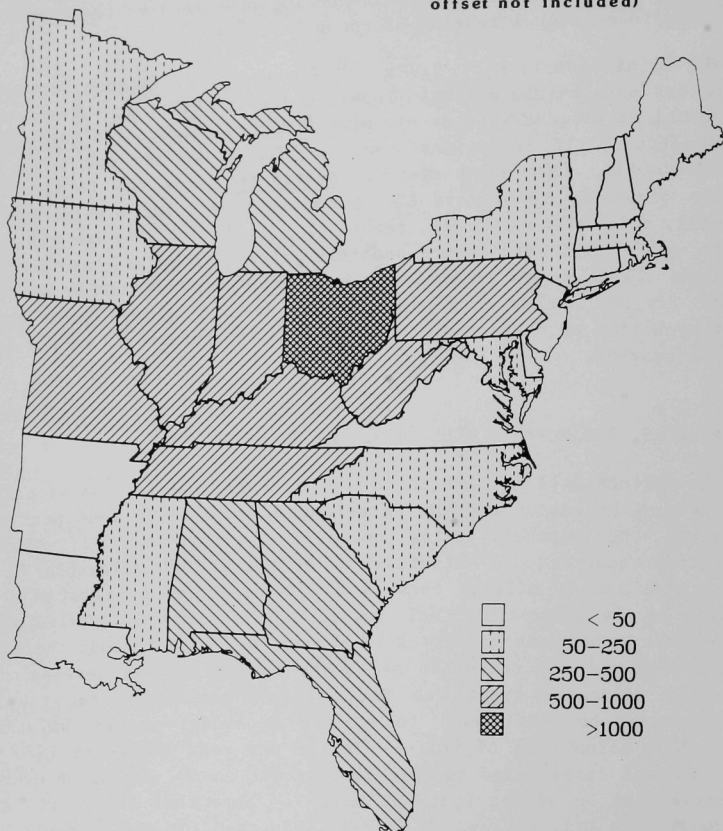


Fig. 6 State-Level Distribution of Emission Reductions  
Required by the D'Amours Bill (Literal Reading)

Base Reduction :  $9.9 \times 10^6$  T/Y  
SIP Allowance :  $-1.0 \times 10^6$  T/Y  
Total Reduction :  $9.0 \times 10^6$  T/Y  
(growth offset not included)

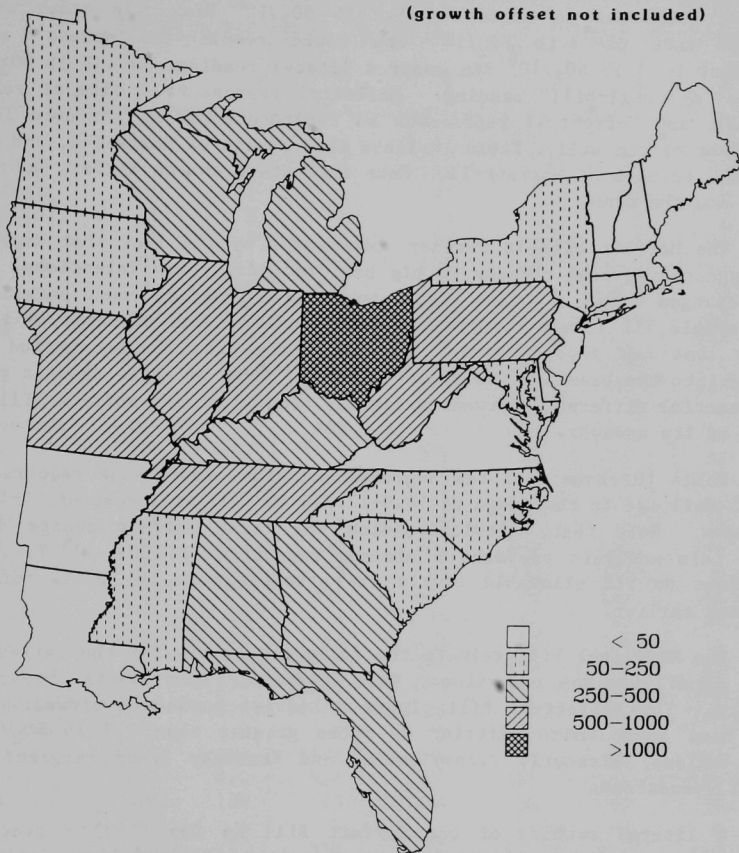


Fig. 7 State-Level Distribution of Emission Reductions Required by the D'Amours Bill (Best Interpretation of Congressional Intent)

both cases are analyzed: Moffett-I, in which state shares are calculated on the basis of total emissions from plants emitting at a rate greater than 1.2 lb  $\text{SO}_2/10^6$  Btu; and Moffett-II, in which state shares are calculated on the basis of emissions in excess of 1.2 lb  $\text{SO}_2/10^6$  Btu. In other words, an emission rate of 3 lb  $\text{SO}_2/10^6$  Btu would result in "excess" emissions equivalent to 3 lb  $\text{SO}_2/10^6$  Btu under a literal reading, or 1.8 lb  $\text{SO}_2/10^6$  Btu under a "Mitchell-Bill" reading. Moffett-I represents a literal reading of the bill, and Moffett-II represents an interpretation of presumed intent of the author of the bill. Table 10 lists the results of Moffett-I, and Table 11 lists the results of Moffett-II. Note that state shares differ, but regional totals are the same.

The Moffett Bill is further complicated by the fact that Rep. Moffett has suggested several changes to his bill to clarify his intentions. The two major changes were: 1) that states would be allowed to count emissions down to allowable SIP levels towards the emission reduction required by the bill, and 2) that new sources coming on line during the 10-year period will be counted into the baseline (no growth offset). Both of these changes result in a substantial difference between a literal reading of the Moffett Bill and the intent of its sponsor.

Table 10 shows that the regional emissions reductions required by the Moffett Bill are in the range of  $10.0\text{--}13.3 \times 10^6$  T/y at a cost of  $\$4\text{--}5.3 \times 10^9$  per year. Note that, notwithstanding the first Moffett change described above, this analysis projects a minimum reduction of  $10 \times 10^6$  T/y, because reductions to SIP allowable levels are attributed to the bills for reasons discussed earlier.

The Moffett-I Bill selects the following states for the largest shares of the 10-million ton reduction: Ohio, Indiana, Pennsylvania, Missouri, and Kentucky. The Moffett-II Bill places a heavier burden on midwestern states which have large units emitting at rates greater than 1.2 lb  $\text{SO}_2/10^6$  Btu: Ohio, Indiana, Missouri, Pennsylvania, and Kentucky being targeted for the largest reductions.

A literal reading of the Moffett Bill is Case I(D) - state shares calculated on the basis of total plant emissions, growth offset included, and an SIP allowance added to the base reduction. The intention of Rep. Moffett is interpreted to be Case II(A). These are the two cases illustrated in Figs. 8 and 9 and used in the comparative analysis.

## 2.5 S.3041, THE COMMITTEE BILL

On July 22, 1982, the Senate Committee on Environment and Public Works approved a modification of the acid rain control program contained in the Mitchell Bill. This "Committee Bill" is included in the comprehensive Clean Air Act Amendments package reported out of Committee on August 19, 1982, and introduced as S. 3041 on November 15, 1982. The approved proposal differs

Table 10 Emissions Reductions and Costs of the Moffett-I Bill

	Emission Reduction ( $10^3\text{T/y}$ )				Cost ( $\$10^6/\text{yr}$ )			
	A	B	C	D	A	B	C	D
Alabama	348	460	354	466	139	184	142	186
Arkansas	3	159	7	163	1	64	3	65
Connecticut	0	41	0	41	0	16	0	16
Dist. of Col.	0	3	0	3	0	1	0	1
Delaware	30	-8	56	19	12	-3	22	8
Florida	400	509	400	509	160	204	160	204
Georgia	497	768	522	794	199	307	209	318
Iowa	113	226	113	226	45	90	45	90
Illinois	630	1,004	669	1044	252	402	268	418
Indiana	1,002	610	1,052	661	401	244	421	264
Kentucky	714	464	1,082	832	286	186	433	333
Louisiana	0	527	0	527	0	211	0	211
Massachusetts	105	26	162	82	42	10	65	33
Maryland	146	267	155	276	58	107	62	110
Maine	1	0	1	0	0	0	0	0
Michigan	298	503	298	504	119	201	119	202
Minnesota	66	126	66	126	26	50	26	50
Missouri	753	804	753	804	301	322	301	322
Mississippi	81	65	86	69	32	26	34	28
N. Carolina	241	475	241	475	96	190	96	190
N. Hampshire	54	56	54	56	22	22	22	22
N. Jersey	44	275	44	275	18	110	18	110
New York	270	141	273	144	108	56	109	58
Ohio	1,485	1,499	1,658	1,673	594	600	663	669
Pennsylvania	931	1,001	1,060	1,129	372	400	424	452
Rhode Island	0	8	0	8	0	3	0	3
S. Carolina	128	305	129	306	51	122	52	122
Tennessee	630	652	807	829	252	261	323	332
Virginia	89	129	95	134	36	52	38	54
Vermont	0	4	0	4	0	2	0	2
Wisconsin	296	253	330	287	118	101	132	115
W. Virginia	645	794	666	815	258	318	266	326
Total	10,000	12,146	11,133	13,279	4,000	4,858	4,453	5,312

A: Base reduction of  $10 \times 10^6$  T/y.

B: Base reduction with growth offset.

C: Base reduction with SIP allowance added.

D: Base reduction with growth offset and SIP allowance.

Table 11 Emissions Reductions and Costs of the Moffett-II Bill

	Emission Reduction ( $10^3$ T/y)				Cost ( $\$10^6$ /yr)			
	A	B	C	D	A	B	C	D
Alabama	268	380	274	386	107	152	110	154
Arkansas	2	158	6	162	1	63	2	65
Connecticut	0	41	0	0	0	16	0	16
Dist. of Col.	0	3	0	3	0	1	0	1
Delaware	25	-13	52	14	10	-5	21	6
Florida	336	444	336	444	134	178	134	178
Georgia	457	728	482	754	183	291	193	302
Iowa	125	237	125	237	50	95	50	95
Illinois	758	1,132	797	1,171	303	453	319	468
Indiana	1,168	776	1,218	827	467	310	487	331
Kentucky	767	518	1,136	886	307	207	454	354
Louisiana	0	527	0	527	0	211	0	211
Massachusetts	71	-8	128	49	28	-3	51	20
Maryland	109	230	119	240	44	92	48	96
Maine	1	0	1	0	0	0	0	0
Michigan	227	433	228	434	91	173	91	174
Minnesota	56	116	56	116	22	46	22	46
Missouri	903	953	903	953	361	381	361	381
Mississippi	76	59	80	64	30	24	32	26
N. Carolina	86	320	86	320	34	128	34	128
N. Hampshire	50	52	50	52	20	21	20	21
N. Jersey	36	267	36	267	14	107	14	107
New York	219	91	222	93	88	36	89	37
Ohio	1,688	1,703	1,862	1,876	675	681	745	750
Pennsylvania	852	921	980	1,049	341	368	392	420
Rhode Island	0	8	0	8	0	3	0	3
S. Carolina	95	273	96	273	38	109	38	109
Tennessee	671	693	848	870	268	277	339	348
Virginia	26	66	32	71	10	26	13	28
Vermont	0	4	0	4	0	2	0	2
Wisconsin	340	298	374	331	136	119	150	132
W. Virginia	589	737	610	758	236	295	244	303
Total	10,000	12,146	11,133	13,279	4,000	4,858	4,453	5,312

A: Base reduction of  $10 \times 10^6$  T/y.

B: Base reduction with growth offset.

C: Base reduction with SIP allowance added.

D: Base reduction with growth offset and SIP allowance.



Base Reduction :  $10.0 \times 10^6$  T/Y  
New Growth :  $2.1 \times 10^6$  T/Y  
SIP Allowance :  $1.1 \times 10^6$  T/Y  
Total Reduction :  $13.3 \times 10^6$  T/Y

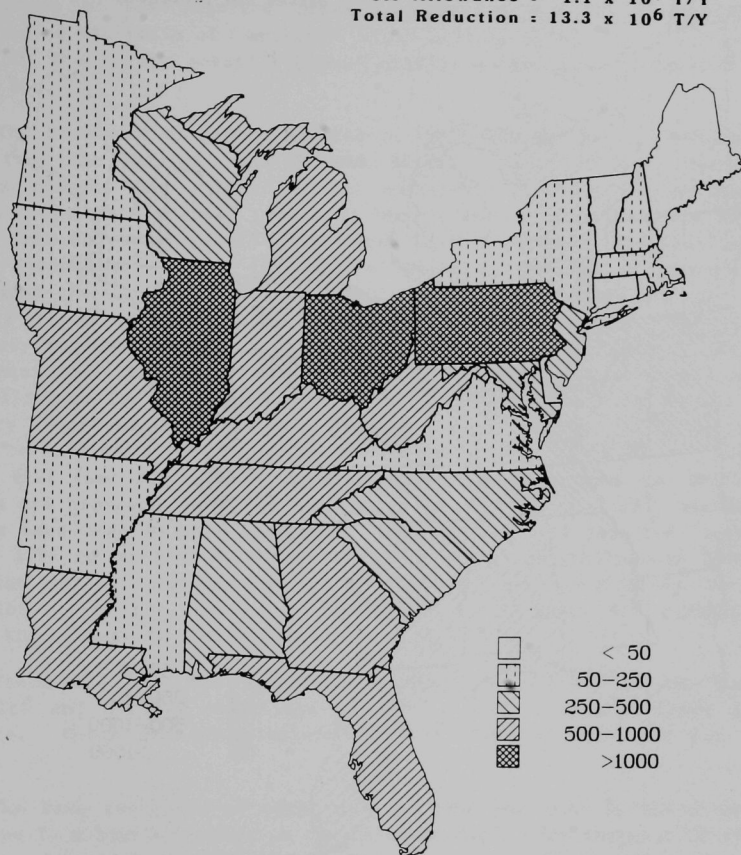


Fig. 8 State-Level Distribution of Emission Reductions Required by the Moffett Bill (Literal Reading)

Base Reduction =  $10.0 \times 10^6$  T/Y  
(SIP allowance and growth  
offset not included)

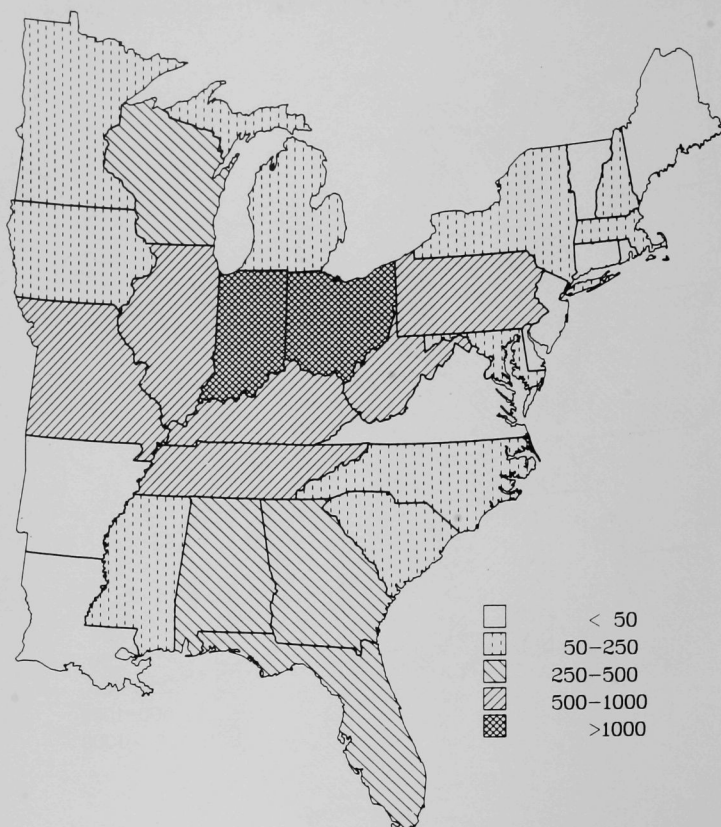


Fig. 9 State-Level Distribution of Emission Reductions Required by the Moffett Bill (Best Interpretation of Congressional Intent)

most significantly from the Mitchell Bill in that it sets an  $8 \times 10^6$  T/y target for  $\text{SO}_2$  reduction, rather than a  $10 \times 10^6$  T/y target. The schedule for achievement of the reduction is also increased from ten to twelve years. State shares of the required regional reduction are to be determined in proportion to the ratio of the actual state utility emissions in excess of  $1.5 \text{ lb } \text{SO}_2/10^6 \text{ Btu}$  to the actual regional utility emissions in excess of  $1.5 \text{ lb } \text{SO}_2/10^6 \text{ Btu}$ .

The treatment of growth offsets in the Committee Bill is somewhat different from the Mitchell and Moffett Bills. Sec. 183(b)(1) specifically requires offsets for sulfur dioxide emissions from new major stationary sources. For this reason, growth in mobile source emissions has been subtracted from the total growth projections in the Committee Bill analysis (see earlier discussion). Sec. 183(b)(2)(A) exempts from the  $\text{SO}_2$  growth offset requirement those states having no major sources with an emission rate greater than  $1.2 \text{ lb}/10^6 \text{ Btu}$  in 1980. Sec. 183(e) requires that existing major stationary sources do not increase their emissions of nitrogen oxides; there is no requirement for offsetting emissions of  $\text{NO}_x$  from new sources, and there is no allowance for  $\text{NO}_x$  credits. For these reasons, the total growth offset necessary under the Committee Bill amounts to only  $1.39 \times 10^6$  T/y of  $\text{SO}_2$ , as opposed to  $3.57 \times 10^6$  T/y under the Mitchell Bill and  $2.15 \times 10^6$  T/y under the Moffett Bill (see Table 6). Louisiana, New Hampshire, and the District of Columbia are exempted under the provisions of Sec. 183(b)(2)(A), according to the data base used in this analysis. Although the bill requires growth from 1980 to 1995 to be offset, this analysis examined growth through 2000; this assumption is not unreasonable given the inherent uncertainty in growth projections. In the absence of clarifying provisions, SIP compliance is treated the same as in the Mitchell Bill analysis.

Table 12 lists the specified emissions reductions of the Committee Bill, with and without reductions associated with a growth offset and SIP allowance. Costs are also included on the basis of \$400 per ton of  $\text{SO}_2$  removed.

The base reduction of eight million tons per year is allocated among the states in a similar manner to the Mitchell Bill. The increase in the cut-off value from  $1.2$  to  $1.5 \text{ lb}/10^6 \text{ Btu}$  does not greatly affect the state shares. Ohio, Indiana, Missouri, Illinois, and Pennsylvania are the states targeted for the largest reductions.

In comparison with the Mitchell Bill, the new treatment of growth limits the additional reduction required in Louisiana, as mentioned above, and in Ohio, Illinois, and Florida, which have high projected increases in  $\text{NO}_x$  emissions from stationary sources. Ohio, Illinois, Missouri, Pennsylvania, and Georgia are the five states targeted for the largest reductions if new growth is required to be offset. Indiana is, again, affected greatly by the large reduction in  $\text{SO}_2$  emissions projected to occur in the absence of any acid rain control bill. The reduction needed to meet SIP compliance levels ( $1.13 \times$

Table 12 Emissions Reductions and Costs of the Committee Bill

	Emission Reduction ( $10^3$ T/y)				Cost ( $\$10^6$ /yr)			
	A	B	C	D	A	B	C	D
Alabama	184	292	178	286	74	117	71	114
Arkansas	1	155	-3	151	0	62	-1	60
Connecticut	0	32	0	32	0	13	0	13
Dist. of Col.	0	0	0	0	0	0	0	0
Delaware	18	-19	-9	-46	7	-8	-4	-18
Florida	246	351	246	351	98	140	98	140
Georgia	352	614	327	589	141	246	131	236
Iowa	107	215	107	215	43	86	43	86
Illinois	651	1,007	611	968	260	403	244	387
Indiana	995	591	944	541	398	236	378	216
Kentucky	631	378	263	10	252	151	105	4
Louisiana	0	0	0	0	0	0	0	0
Massachusetts	45	-49	-12	-105	18	-20	-5	-42
Maryland	74	189	64	180	30	76	26	72
Maine	3	1	3	1	1	0	1	0
Michigan	158	343	157	342	63	137	63	137
Minnesota	41	95	41	95	16	38	16	38
Missouri	775	818	775	818	310	327	310	327
Mississippi	63	54	59	50	25	22	24	20
N. Carolina	12	237	12	237	5	95	5	95
N. Hampshire	38	38	38	38	15	15	15	15
N. Jersey	26	240	26	240	10	96	10	96
New York	156	13	154	11	62	5	62	4
Ohio	1,421	1,410	1,247	1,236	568	564	499	494
Pennsylvania	650	699	522	571	260	280	209	228
Rhode Island	1	6	1	6	0	2	0	2
S. Carolina	65	240	64	239	26	96	26	96
Tennessee	550	563	374	387	220	225	150	155
Virginia	-2	35	-7	30	-1	14	-3	12
Vermont	3	6	3	6	1	2	1	2
Wisconsin	288	238	254	205	115	95	102	82
W. Virginia	448	595	427	574	179	238	171	230
Total	8,000	9,389	6,867	8,257	3,200	3,756	2,747	3,303

A: Base reduction of  $8 \times 10^6$  T/y.

B: Base reduction with growth offset.

C: Base reduction with SIP allowance subtracted.

D: Base reduction with growth offset and SIP allowance.

$10^6$  T/y) is the same as in the Mitchell Bill, so that the additional reduction beyond SIP levels required by the Committee Bill is  $6.9 \times 10^6$  T/y.

Assuming that both a growth offset and an SIP allowance are appropriate, then the reduction required by the Committee Bill is  $8.3 \times 10^6$  T/y, concentrated largely in Ohio, Illinois, Missouri, Georgia, and Pennsylvania. Because of projected decreases in  $\text{SO}_2$  emissions in Delaware and Massachusetts by the year 2000, these two states result in a negative reduction required by the bill, i.e., future levels of emission will, in the absence of any bills, be lower than the levels required by the Committee Bill. In practice, these "gains" in emission reduction could be used to offset reductions required in other states, but this possibility cannot be analyzed here.

The range of emissions reductions under the Committee Bill is therefore  $6.9 - 9.4 \times 10^6$  T/y, depending on interpretation of the language of the bill, with costs in the range of  $\$2.7 - 3.8 \times 10^9$  per year. This is in good agreement with a preliminary estimate by ICF, Inc., of  $\$3.0 \times 10^9$  per year.<sup>6</sup> Costs in the most heavily impacted state, Ohio, are projected to be in the range of  $\$490-570 \times 10^6$  per year.

As with the Mitchell Bill, Case B represents a literal reading of the Committee Bill, and Case D represents a best interpretation of Congressional intent. Figures 10 and 11, respectively, show the state-level distributions of emission reductions required for these cases.

Base Reduction :  $8.0 \times 10^6$  T/Y  
New Growth :  $1.4 \times 10^6$  T/Y  
Total Reduction :  $9.4 \times 10^6$  T/Y  
(SIP allowance not included)

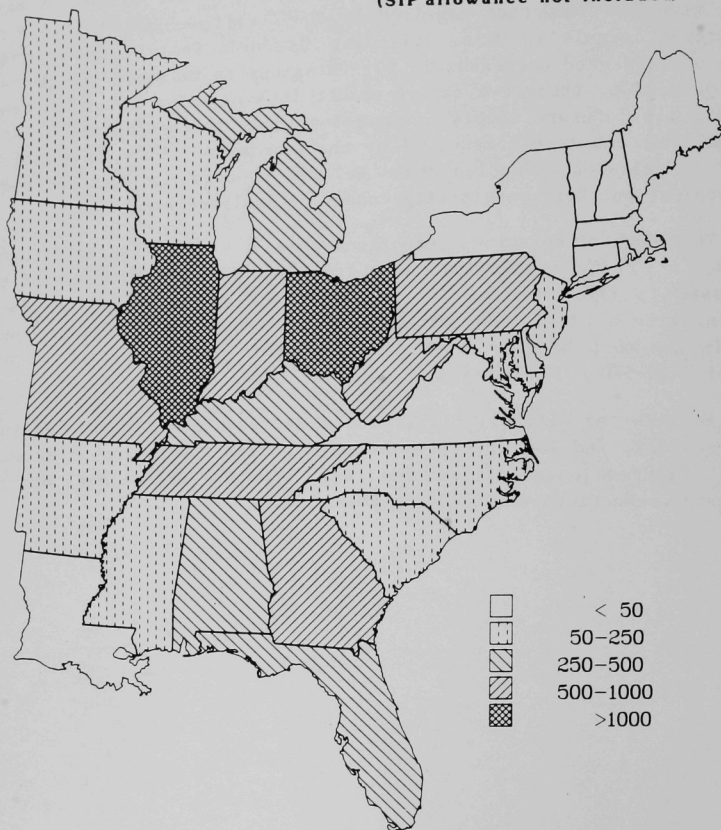


Fig. 10 State-Level Distribution of Emission Reductions Required by the Committee Bill (Literal Reading)



Base Reduction :  $8.0 \times 10^6$  T/Y  
 New Growth :  $1.4 \times 10^6$  T/Y  
 SIP Allowance :  $-1.1 \times 10^6$  T/Y  
 Total Reduction :  $8.3 \times 10^6$  T/Y

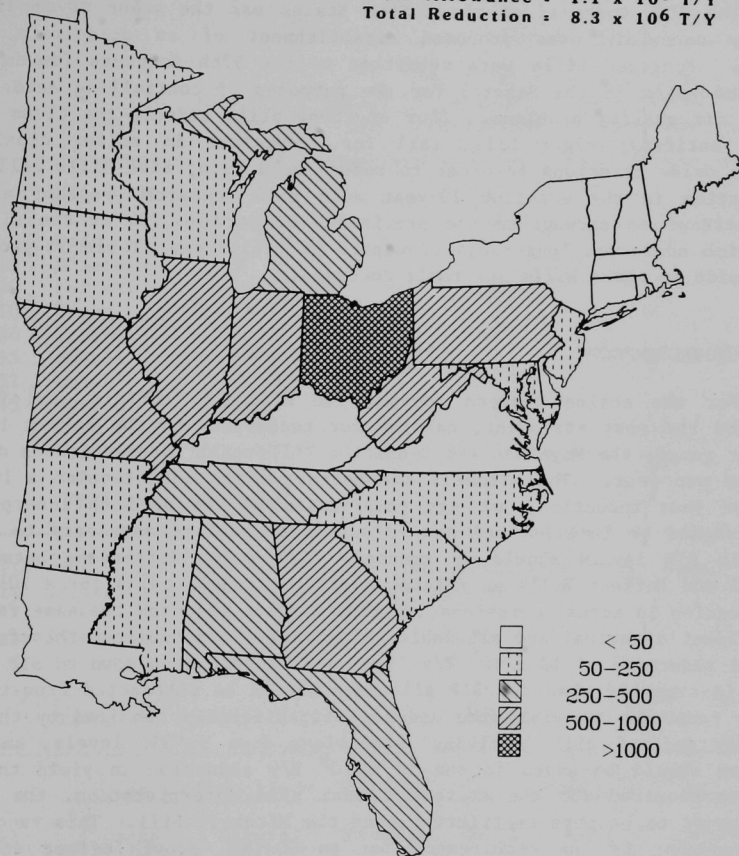


Fig. 11 State-Level Distribution of Emission Reductions  
 Required by the Committee Bill (Best Interpretation  
 of Congressional Intent)

### 3 COMPARISON OF THE IMPACTS OF THE BILLS

The 97th Congress of the United States was the scene of considerable activity concerning the proposed establishment of an acid rain control program. Fourteen bills were submitted to the 97th Congress (seven in the House and seven in the Senate) for the purposes of controlling acid rain or related air quality problems. Four of these bills address the Clean Air Act in its entirety; eight bills call for reductions in sulfur dioxide and nitrogen oxide emissions in order to reduce acid rain; five bills call for an acceleration in the existing 10-year acid rain research program; and four bills attempt to strengthen the provisions of Section 126 of the Clean Air Act, which addresses long-range transport of pollution. Table 13 provides a brief guide to these bills and their coverage.

#### 3.1 REGIONAL IMPACTS

For the entire eastern region, the Mitchell, Moffett, and D'Amours Bills are the most stringent, calling for reductions in the  $9-13 \times 10^6$  tons per year range; the Moynihan and Committee Bills call for reductions of  $6-8 \times 10^6$  tons per year. The Mitchell and Moffett Bills both require a  $10 \times 10^6$  tons per year reduction, but are complicated by the need to interpret how growth should be included and how emissions reductions necessary to achieve allowable SIP levels should be treated. The major difference between the Mitchell and Moffett Bills as written is that Mitchell calls for a 10-million ton reduction in actual emissions, whereas Moffett requires the same reduction in the lower of actual and allowable emissions. In actuality, therefore, the Mitchell reduction of  $10 \times 10^6$  T/y "includes" a reduction down to SIP levels, and it is arguable that the SIP allowance should be subtracted from the  $10 \times 10^6$  T/y reduction to yield the reduction specifically required by the bill; while the Moffett Bill "excludes" reductions down to SIP levels, and a SIP allowance should be added to the  $10 \times 10^6$  T/y reduction to yield the total reduction required for the states. Under this interpretation, the Moffett Bill appears to be more restrictive than the Mitchell Bill. This is counteracted somewhat by the requirement for an  $\text{SO}_2/\text{NO}_x$  growth offset under the Mitchell Bill, and a simple  $\text{SO}_2$  growth offset under the Moffett Bill.

However, Rep. Moffett has subsequently indicated that he does not intend growth to be offset, and that reductions to SIP levels can be counted towards the 10-million ton reduction. This greatly reduces the impact of the bill. It is not clear whether Sen. Mitchell supports the same interpretation of his bill. In this analysis, several possible interpretations of these bills are presented. Table 14 summarizes the impacts of the five bills in the 31-state region, with the assumption that, where alternative interpretations are possible, reductions to SIP levels are attributable to the acid rain bills.

Table 13 Summary of Bills Addressing Acid Rain and Related Issues

Bill	Sponsor	Proposal Date	Coverage of the Bill			
			Entire CAA	Acid Rain: Emission Reductions	Acid Rain: Accelerated Research	LRT Provisions
S. 1706	Mitchell	10-6-81		X		
S. 1709	Moynihan	10-6-81		X <sup>a</sup>		
S. 1718	Dodd	10-7-81				X
H.R. 4816	D'Amours	10-22-81		X		
H.R. 4829	Moffett	10-22-81		X <sup>b</sup>		
H.R. 4830	Gregg	10-22-81			X	
H.R. 4936	Scheuer	11-10-81		X <sup>a</sup>		
H.R. 5055	Rahall	11-19-81			X <sup>c</sup>	
H.R. 5252	Luken	12-16-81	X			
H.R. 5555	Waxman	2-22-82	X	X <sup>b</sup>		X
S. 2266	Byrd	3-24-82	X		X <sup>c</sup>	
S. 2594	Danforth	5-27-82		X		X
S. 2959	Randolph	9-24-82			X <sup>c</sup>	
S. 3041	Committee	8-19-82 <sup>d</sup>	X	X	X	X

<sup>a,b,c</sup>Bills with the same superscript are essentially the same. Bills primarily addressing mobile sources are not included.

<sup>d</sup>Bill was introduced on 11-15-82.

Table 14 Summary of the Regional Impacts of the Bills

Bill	Emission Reductions (10 <sup>6</sup> T/y)			Costs (\$10 <sup>9</sup> py)		
	Range <sup>a</sup>	Literal	Intended	Range <sup>a</sup>	Literal	Intended
Mitchell	8.9-13.6	13.6	12.4	3.5-5.4	5.4	5.0
Moynihan	6.5-7.6	7.6	6.5	2.6-3.1	3.1	2.6
D'Amours	9.0-9.9	9.9	9.0	3.6-4.0	4.0	3.6
Moffett	10.0-13.3	13.3	10.0	4.5-5.3	5.3	4.0
Committee	6.9-9.4	9.4	8.3	2.7-3.8	3.8	3.3

<sup>a</sup>The range covers all reasonable interpretations of the bills.

Regarding the manner in which sources are selected for reduction in emissions, the bills are quite different. Mitchell and Moffett both target a specific, somewhat arbitrary, reduction in regional emissions to be levied largely on states with plants having emission rates in excess of 1.2 lb  $\text{SO}_2/10^6$  Btu. The Committee Bill raises the Mitchell cut-off from 1.2 lb  $\text{SO}_2/10^6$  Btu to 1.5 lb  $\text{SO}_2/10^6$  Btu. The bills do not address whether the reductions required can be reasonably achieved within the performance levels of available control technology. Moynihan and D'Amours both take this into account by requiring the equivalent of 85% reduction in emissions from the major sources -- presumably considered to be equivalent to the expected performance of a retrofit FGD system on a utility power plant. The Moynihan Bill has an additional cut-off of a 3 lb  $\text{SO}_2/10^6$  Btu emission rate, meaning that only sources with the highest emission rates are targeted for controls. None of the bills are tailored to give emissions reductions in the locations where maximum mitigation of impacts would be achieved; and no attempt is made to clean up emissions in the most cost-effective manner (although certain bills allow for negotiation among states, which would presumably tend to minimize costs to some extent).

The emissions reductions called for by the bills, 41-85% of actual 1980  $\text{SO}_2$  emissions in the region, are undoubtedly very large; the costs are also very high:  $\$2.6\text{-}5.4 \times 10^9$  per year. This report does not consider whether such reductions can be realistically achieved, or whether the cost is justified in view of the uncertainty concerning the improvement in environmental conditions that can be expected. These questions merit detailed examination, nonetheless.

### 3.2 STATE-LEVEL IMPACTS

Table 15 lists the emissions reductions required for the five most heavily impacted states in decreasing order of the reduction required. Also shown are the state percentages of the total regional reduction and the percentage of 1980 actual emissions in the state. A number of points are immediately apparent. The most heavily impacted states are those that have the highest current emissions of  $\text{SO}_2$ . Therefore, the bills affect primarily the states in the industrial midwestern belt, covering Illinois, Indiana, Ohio, and Pennsylvania. Ohio always takes the largest share of the reduction, between 12% and 19% of the total reduction. When emissions reductions needed to achieve SIP allowable levels are taken into account, those states with actual 1980 emissions considerably in excess of allowable emissions are affected to a larger extent: Tennessee, Kentucky, and Pennsylvania being principally affected. The state of Missouri is also significantly affected because of the high level of currently allowable emissions.

The emissions reductions under the Moynihan Bill are concentrated in 16 states because of the requirement that the reduction be determined for plants with a 1980 actual emission rate greater than 3 lb  $\text{SO}_2/10^6$  Btu. New England and Atlantic Coast states are minimally affected.

Table 15 Emissions Reductions Required in the Most Heavily Impacted States

Mitchell			Moynihan		D'Amours		Moffett		Committee	
Literat	Interpreted		Literat	Interpreted	Literat	Interpreted	Literat	Interpreted	Literat	Interpreted
A	OH	OH	OH	OH	OH	OH	OH	OH	OH	OH
B	1.89	1.71	1.37	1.20	1.66	1.52	1.67	1.69	1.41	1.24
C	13.9	13.7	18.0	18.5	16.8	17.0	12.6	16.9	15.0	15.0
D	84.4	76.3	61.2	53.6	74.1	67.9	74.6	75.4	62.9	55.4
A	IL	IL	KY	MO	PA	MO	PA	IN	IL	IL
B	1.26	1.22	0.86	0.79	0.98	0.91	1.13	1.17	1.01	0.97
C	9.3	9.8	11.3	12.2	9.9	10.2	8.5	11.7	10.8	11.7
D	112.5	108.9	81.1	69.9	67.6	80.5	77.9	77.0	90.2	86.6
A	PA	MO	IN	IN	IN	IN	IL	MO	MO	MO
B	0.99	0.96	0.84	0.79	0.93	0.88	1.04	0.90	0.82	0.82
C	7.3	7.7	11.0	12.2	9.4	9.8	7.8	9.0	8.7	9.9
D	68.3	85.0	55.3	52.0	61.2	57.9	92.9	79.6	72.6	72.6
A	MO	PA	TN	TN	MO	PA	KY	PA	PA	GA
B	0.96	0.87	0.84	0.67	0.91	0.85	0.83	0.85	0.70	0.59
C	7.1	7.0	11.0	10.2	9.2	9.5	6.2	8.5	7.5	7.1
D	85.0	60.0	90.3	71.4	80.5	58.6	78.3	58.6	48.3	79.7
A	W.VA	W.VA	MO	IL	IL	IL	TN	KY	GA	W.VA
B	0.83	0.81	0.79	0.60	0.75	0.73	0.83	0.77	0.61	0.57
C	6.1	6.5	10.4	9.2	7.6	8.2	6.2	7.7	6.5	6.9
D	85.6	83.5	69.9	53.6	67.0	65.2	89.2	72.6	82.4	58.8

A: State.

B: Emissions reductions required ( $10^6$  T/y).

C: Percent of regional reduction required.

D: Percent of 1980 actual utility emissions in the state.

The emissions reductions required at the state level are often a very high proportion of the 1980 actual emissions; for example, under the Mitchell Bill, reductions greater than 100% of 1980 actual utility emissions would be required in Illinois. Four options are possible in such situations: emissions reductions from new sources in excess of 0.6 lb of  $\text{SO}_2/10^6$  Btu would have to be achieved ( $>$  NSPS), significant reductions would have to be achieved from industrial sources,  $\text{NO}_x$  emission reductions would have to occur (at a 2:1 ratio to  $\text{SO}_2$ ), or trading mechanisms would have to be invoked among states. In several states (Arkansas and Louisiana, for example) new growth in emissions is anticipated to be large in comparison with current emissions; therefore, under bills which require growth offsets, very high levels of pollutant removal would be necessary from new sources and/or industrial sources in these states, or special provisions to alleviate this impact would be needed.

Table 16 summarizes the range of impacts in the five states affected to the greatest extent: Ohio, Indiana, Pennsylvania, Missouri, and Illinois. In Ohio, emissions reductions of between 1.2 and 1.9 million tons per year would be required at a cost of \$480-750 million per year. The impacts in the other four states are about half this magnitude. Clearly, these kinds of impacts are very large and would cause significant economic effects in the Midwest if any of the bills are enacted and implemented.

Table 16 Greatest Potential Impacts at the State Level

State	1980 Actual Utility Emissions ( $10^3$ T/y)	Range of Emissions Reduction Required ( $10^3$ T/y)	Range of Projected Costs ( $10^6$ /y)
Ohio	2240	1200-1890	480-750
Indiana	1522	540- 930	220-370
Pennsylvania	1448	570-1130	230-450
Missouri	1131	790- 962	320-390
Illinois	1115	640-1260	250-510



## REFERENCES

1. *Estimates of Sulfur Oxide Emissions from the Electric Utility Industry*, E.H. Pechan & Associates, unpublished data prepared for U.S. EPA (Sept. 1982).
2. Rivers, M., and K. Riegel, Final Report of Work Group 3B, submitted to the Coordinating Committee created under the August 6, 1980, Memorandum of Intent on Transboundary Air Pollution.
3. Speyer, J., *Impact of Alternative Approaches to Implement the Mitchell Bill on the Electric Utility and Coal Industries*, paper 82-16.2 presented at the 75th Annual Meeting of the Air Pollution Control Association, New Orleans (June 20-25, 1982).
4. ICF, Inc., prepared several analyses of this bill for different sponsors. A summary of the results of these and other analyses is given in L. Parker, *Summary and Analysis of Technical Hearings on Costs of Acid Rain Bills*, Congressional Research Service (July 26, 1982).
5. Analysis by the Office of Technology Assessment, reported in Environment Reporter, Current Developments, 12(28):837 (Nov. 6, 1981).
6. ICF, Inc., memorandum from K.A. Schweers and B. Braine to EPA staff, *Preliminary Forecasts Evaluating the Impacts of the "Senate Bill" for a 1995 Reduction in Sulfur Dioxide Emissions Assuming Intrastate Trading* (Aug. 27, 1982).



## APPENDIX

## PROVISIONS OF THE BILLS

This section consists of copies of the five major bills requiring emissions reductions to mitigate the effects of acid rain:

- S. 1706      The Mitchell Bill
- S. 1709      The Moynihan Bill
- H.R. 4816    The D'Amours Bill
- H.R. 4829    The Moffett Bill
- S. 3041      The Committee Bill (Sec. 120 only)

## S. 1706

To amend the Clean Air Act to better protect against interstate transport of pollutants, to control existing and new sources of acid deposition, and for other purposes.

### IN THE SENATE OF THE UNITED STATES

OCTOBER 6 (legislative day, SEPTEMBER 9), 1981

Mr. MITCHELL (for himself, Mr. STAFFORD, Mr. CHAFEE, Mr. COHEN, Mr. DURENBERGER, Mr. HART, Mr. DODD, Mr. TSONGAS, Mr. RUDMAN, Mr. LEAHY, Mr. MOYNIHAN, and Mr. DANFORTH) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

## A BILL

To amend the Clean Air Act to better protect against interstate transport of pollutants, to control existing and new sources of acid deposition, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*  
3 That this Act may be cited as the "Acid Deposition Control  
4 Act".

5 SEC. 2. Title I of the Clean Air Act is amended by  
6 adding the following new part:

2

### "PART E—INTERSTATE TRANSPORT AND ACID PRECURSOR REDUCTION

#### "FINDINGS AND PURPOSES

"SEC. 180. (a) The Congress finds that:

"(1) the long-range transport of pollutants and  
their transformation products is an interstate and inter-  
national problem;

"(2) current levels of emissions of air pollutants  
from existing sources as well as increased emissions  
from new existing sources threaten public health and  
welfare and the environment in States and countries  
other than those in which emitted;

"(3) reduction of total regional atmospheric load-  
ing of pollutants such as sulfur oxides and nitrogen  
oxides will enhance protection of public health and  
welfare and the environment;

"(4) more effective regulation of the interstate  
transport of air pollutants is needed in order to protect  
the health and welfare of the citizens of downwind  
States and the economic growth opportunities of down-  
wind States; and

"(5) in particular,

"(A) the deposition of acid compounds from  
the atmosphere is causing and contributing to  
widespread long-term ecosystem degradation;

1           “(B) the principal source of the acid com-  
2       pounds in the atmosphere, and their precursors, is  
3       the combustion of fossil fuels;

4           “(C) the problem of acid deposition is of na-  
5       tional and international significance and cannot be  
6       addressed adequately without Federal interven-  
7       tion;

8           “(D) control strategies and technology for  
9       precursors to acid deposition exist now that are  
10      economically feasible; and

11          “(E) current and future generations of  
12      Americans will be more adversely affected by de-  
13      layed action, so that efforts to remedy the prob-  
14      lem should commence now.

15      “(b) The purposes of this part are to:

16          “(1) protect public health and welfare and the en-  
17      vironment from any actual or potential adverse effect  
18      caused by ambient concentrations or deposition of air  
19      pollutants, including the products of atmospheric trans-  
20      formation of pollutants; and

21          “(2) preserve the rights and responsibilities of  
22      States to protect the public health and welfare and the  
23      environment of their citizens from air pollution origi-  
24      nating in other States.

1           “ESTABLISHMENT OF REGION

2           “SEC. 181. (a) There is hereby established a long-range  
3      transport corridor, hereafter referred to as the “acid deposi-  
4      tion impact region,” consisting of the States of Alabama, Ar-  
5      kansas, Connecticut, Delaware, Florida, Georgia, Illinois,  
6      Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Mas-  
7      sachusetts, Michigan, Minnesota, Mississippi, Missouri, New  
8      Hampshire, New Jersey, New York, North Carolina, Ohio,  
9      Pennsylvania, Rhode Island, South Carolina, Tennessee,  
10     Vermont, Virginia, West Virginia, Wisconsin, and the Dis-  
11     trict of Columbia.

12          “(b) The Administrator shall conduct a study of air pol-  
13      lution problems associated with long-range transport of pol-  
14      lutants in the portions of the continental United States not  
15      included in (a) of this section. Not later than two years after  
16      the enactment of this section, the Administrator shall report  
17      to the Congress the results of such study.

18           “ACID PRECURSOR CONTROLS

19          “SEC. 182. (a) Emissions of sulfur dioxide and of oxides  
20      of nitrogen from stationary sources in the acid deposition  
21      impact region established under section 181(a) of this Act  
22      shall not be allowed to increase over the total actual emis-  
23      sions of each pollutant in such region as of January 1, 1981.  
24      No major stationary source in such region shall significantly  
25      increase its emissions of sulfur dioxide or of oxides of nitro-

1 gen, unless there has been identified for such source in ac-  
 2 cordance with section 185 of this Act a net reduction in emis-  
 3 sions of such pollution at one or more points in such region in  
 4 excess of the proposed increase in emissions, and not other-  
 5 wise required by a State implementation plan under section  
 6 110 of this Act or under section 183 or 184 of this Act.

7       “(b) There shall be achieved a reduction in annual emis-  
 8 sions of sulfur dioxide in the acid deposition impact region  
 9 established under section 181(a) of this Act of 10,000,000  
 10 tons from the total actual annual level of such emissions be-  
 11 tween January 1, 1980, and December 31, 1980. Such re-  
 12 duction shall be achieved pursuant to a phased reduction and  
 13 completed no later than ten years after the enactment of this  
 14 part.

#### 15       “STATE SULFUR DIOXIDE REDUCTION REQUIREMENTS

16       “SEC. 183. (a)(1) Each State shall be required to  
 17 achieve within its borders a reduction in annual sulfur dioxide  
 18 emissions equal to that fraction of 10,000,000 tons which is  
 19 the ratio of all the actual utility emissions in such State in  
 20 excess of 1.2 pounds of sulfur per million British thermal  
 21 units to the total in all States in the region of all the actual  
 22 utility emissions in excess of 1.2 pounds of sulfur per million  
 23 British thermal units.

24       “(2) The Governors of any two or more States within  
 25 the region may by agreement reallo among agreeing States

1 the reductions required under (a)(1) provided that the total  
 2 reductions equal the total required under (a)(1).

3       “(b)(1) Not later than two years after the enactment of  
 4 this part, each State shall adopt enforcement measures to  
 5 achieve the reduction in sulfur dioxide emissions required by  
 6 subsection (a) of this section, including emission limitations  
 7 and schedules for compliance for sources within such State  
 8 and other means of emission reduction in accordance with  
 9 section 185 of this Act. The Governor of such State shall  
 10 submit such measures to the Administrator for review in ac-  
 11 cordance with paragraph (2) of this subsection, and to the  
 12 Governors of all other States in the acid deposition impact  
 13 region for comment.

14       “(2) The Administrator shall approve within four  
 15 months such measures submitted under paragraph (1) of this  
 16 subsection if, taking into consideration the comments of Gov-  
 17 ernors of other States in such region, the Administrator finds  
 18 that such measures (A) contain enforceable requirements for  
 19 continuous emission reduction, (B) contain requirements for  
 20 monitoring by the source and enforcement agencies to assure  
 21 that the emission limitations are being met, and (C) are ade-  
 22 quate to achieve the required reduction in sulfur dioxide  
 23 emissions for such State within the time specified in section  
 24 182(b) of this Act.



“(3) Each emission limitation, schedule for compliance or other measure adopted and approved under this subsection shall be deemed a requirement of the State implementation plan approved or promulgated for such State under section 110 of this Act.

“MAJOR STATIONARY SOURCE SULFUR DIOXIDE

REDUCTION REQUIREMENTS

“SEC. 184. In any State in the acid deposition impact region established by section 181(a) of the Act which has not in accordance with section 183(b)(1) of this Act adopted measures to achieve the reduction required by section 183(a) of this Act within two years after enactment, or which has not had such measures approved by the Administrator under section 183(b)(2) of this Act within two years and four months after enactment of this Act, the owner or operator of each fossil-fuel-burning electric generating facility which is a major stationary source which is not subject to section 111(a) shall comply with an emission limitation or limitations for all such facilities owned or operated by the same entity equivalent to an average among such facilities of 1.2 pounds of sulfur per million British thermal units on a thirty-day average. The owner or operator of each such facility shall submit to the Administrator a plan and schedule of compliance for achieving such emission limitation or equivalent emission reduction in accordance with section 185 of this Act, not later

than three years after the enactment of this part. The Administrator shall approve such plan and schedule for compliance if it (A) contains enforceable requirements for continuous emission reduction, (B) contains requirements for monitoring by the source and enforcement agencies to assure that the emission limitations are being met, and (C) will achieve the emission reduction required by this section at the earliest practicable date, but no later than ten years after the enactment of this part. Failure of such owner or operator to submit such approvable plan and schedule within three years after enactment of this part, failure to comply with the plan and schedule of compliance, and failure to achieve the emission reduction required by this section at the earliest practicable date, but no later than ten years after enactment of this Act, shall be violations of emission limitations for the purposes of sections 113, 120, and 304 of this Act.

“ENFORCEABLE EMISSION REDUCTION PROGRAMS

“SEC. 185. (a) For the purposes of maintaining the limitation on emissions required by section 182(a) of this Act or attaining emission reductions required by section 182(b), 183, or 184 of this Act, the following methods or programs for net emission reduction may be used by a State or the owner or operator of a source, if emission limitations under such methods or programs are enforceable by the Federal Government,

1 States other than those in which the emissions occur, and  
2 citizens under section 304 of this Act:

3       “(1) least emissions dispatch to meet electric gen-  
4 erating demand at existing generating capacity;

5       “(2) retirement of major stationary sources at an  
6 earlier date than provided in schedules on file with the  
7 Federal Energy Regulatory Commission, the Internal  
8 Revenue Service, or State utility regulatory agencies;

9       “(3) investments in energy conservation where re-  
10 ductions in emissions can be identified with such in-  
11 vestments;

12       “(4) trading of emission reduction requirements  
13 and actual reductions on a State or regional basis, for  
14 which States and the Administrator are authorized to  
15 establish emission reduction banks or brokerage institu-  
16 tions to facilitate such trading; and

17       “(5) precombustion cleaning of fuels.

18       “(b) A State or the owner or operator of a source re-  
19 quired to achieve emission reductions under section 182, 183,  
20 or 184 of this Act may substitute reduction in emissions of  
21 oxides of nitrogen for required reductions in emissions of  
22 sulfur dioxide, at a rate of two units by weight of oxides of  
23 nitrogen for each unit of sulfur dioxide.”.

24       SEC. 3. Section 110(1)(2)(E) of the Clean Air Act is  
25 amended by inserting after “visibility,” the following: “or

1 (III) contribute to atmospheric loadings of pollutants or their  
2 transformation products which may reasonably be anticipated  
3 to cause or contribute to an adverse effect on public health or  
4 welfare or the environment in any other State or foreign  
5 country.”.

To amend the Clean Air Act to provide for a program to control acid precipitation.

IN THE SENATE OF THE UNITED STATES

OCTOBER 6 (legislative day, SEPTEMBER 9), 1981

Mr. MOYNIHAN introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To amend the Clean Air Act to provide for a program to control acid precipitation.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*  
3 That this Act may be cited as the "Acid Precipitation Con-  
4 trol Act of 1981".

STATEMENT OF FINDINGS

SEC. 2. The Congress finds that—

(1) manmade sulfur dioxide and nitrogen oxide  
emissions are known to be precursors of acid precipita-  
tion;

(2) sulfur dioxide and nitrogen oxide emissions are  
being transported through the atmosphere and deposit-  
ed in both dry and wet forms in areas far from the  
original source of the emissions;

(3) current provisions of the Clean Air Act are  
not adequate to address the problem of acid precipita-  
tion; and

(4) acid precipitation—

(A) is responsible for the elimination of  
aquatic life in hundreds of lakes in the United  
States and thousands of lakes in Canada;

(B) contributes to the increasing levels of  
heavy metal concentration in public reservoirs and  
water distribution systems that often exceed rec-  
ommended standards for human health;

(C) is known to cause the corrosion of metals  
and erosion of buildings and statues made of cal-  
careous rock resulting in substantial economic  
losses;

(D) can cause a retardation of a wide variety  
of forest growth;

(E) can cause adverse changes in the growth  
and development of crops;

(F) is likely to accelerate the processes of  
plant nutrient leaching from soil; and

1 (G) is an interstate and international  
2 problem.

### 3 IMPLEMENTATION PLANS

4 SEC. 3. Section 110(a)(2)(J) of the Clean Air Act is  
5 amended by inserting before the semicolon at the end thereof  
6 the following: “, and part E of this title (relating to acid  
7 precipitation control)”.

### 8 ACID PRECIPITATION CONTROL PROGRAM

9 SEC. 4. Title I of the Clean Air Act is amended by  
10 adding at the end thereof the following new part:

#### 11 “PART E—ACID PRECIPITATION CONTROL

#### 12 “PURPOSES

13 “SEC. 181. The purposes of this part are—

14 “(1) to control acid precipitation by significantly  
15 reducing the precursor emissions of sulfur dioxide and  
16 nitrogen oxide from manmade sources;

17 “(2) to mitigate or prevent adverse ecological im-  
18 pacts and economic losses resulting from acid precipita-  
19 tion; and

20 “(3) to reduce the transport of air pollutants  
21 across international boundaries.

#### 22 “DEFINITIONS

23 “SEC. 182. For the purposes of this part—

24 “(1) the term ‘acid precipitation mitigation region’  
25 means the region consisting of the States of Maine,

1 New Hampshire, Vermont, Massachusetts, Rhode  
2 Island, Connecticut, New York, New Jersey, Pennsyl-  
3 vania, Ohio, Indiana, Illinois, Michigan, Wisconsin,  
4 Minnesota, Iowa, Missouri, Delaware, Maryland, the  
5 District of Columbia, Virginia, West Virginia, North  
6 Carolina, South Carolina, Georgia, Florida, Kentucky,  
7 Tennessee, Alabama, Mississippi, Arkansas, and  
8 Louisiana;

9 “(2) the term ‘major stationary source’ has the  
10 same meaning as defined in section 302(j);

11 “(3) the term ‘major emitting powerplant’ means  
12 a fossil-fuel-fired electric powerplant which—

13 “(A) had total 1980 annual sulfur dioxide  
14 emissions exceeding fifty thousand tons; and

15 “(B) had a 1980 annual sulfur dioxide emis-  
16 sions rate that exceeded three pounds;

17 “(4) the term ‘sulfur dioxide emissions rate’  
18 means the number of pounds of sulfur dioxide emitted  
19 per million British thermal units of energy output; and

20 “(5) the term ‘statewide utility sulfur dioxide  
21 emissions rate’ means the number of pounds of sulfur  
22 dioxide emitted from all utility owned fossil-fuel-fired  
23 electric powerplants having a generating capacity  
24 greater than one megawatt within a State per million

British thermal units of energy output from all such powerplants.

"EMISSIONS REDUCTION REQUIREMENTS

"SEC. 183. (a)(1) Except as otherwise provided in paragraph (2), each State in the acid precipitation mitigation region shall be required to reduce, prior to December 31, 1991, sulfur dioxide emissions from all major stationary sources, as determined for the base year under subsection (b), by an amount equal to 85 per centum of the actual 1980 sulfur dioxide emissions from all major emitting powerplants within such States, but disregarding any emissions from a separate generating unit or units of such powerplants that are subject to the provisions of section 111 of this Act.

"(2) The amount of the reduction in sulfur dioxide emissions required under this subsection for any State shall not exceed—

"(A) in the case of any State having a 1980 annual statewide utility sulfur dioxide emissions rate equal to or less than two pounds, an amount equal to 50 per centum of the base year sulfur dioxide emissions (as determined under subsection (b)) from all fossil-fuel-fired electric powerplants having a generating capacity greater than one megawatt in such State; or

"(B) in the case of any State having a 1980 annual statewide utility sulfur dioxide emissions rate of more than two pounds, an amount equal to 75 per centum of the base year sulfur dioxide emissions (as determined under subsection (b)) from all fossil-fuel-fired electric powerplants having a generating capacity greater than one megawatt in such State.

"(b) For purposes of subsection (a), the base year emissions for major stationary sources and the base year emissions for any powerplant or group of powerplants shall be equal to the total actual annual amount of sulfur dioxide emissions in 1980 from any such major stationary source, from any such powerplant, or from any separate generating unit of such a stationary source or powerplant, which was in operation at any time during the calendar year 1980, but disregarding any such emissions which were in excess of the allowable emissions under the provisions of section 110(a)(2)(B) or section 111 of this Act.

"(c) The Administrator shall, within sixty days after the date of the enactment of this part, identify each major emitting powerplant within the acid precipitation mitigation region, using the best available data and methodology to determine the total actual 1980 sulfur dioxide emissions and the actual 1980 sulfur dioxide emissions rate for each major emitting powerplant.

1       “(d) The Administrator shall, within ninety days after  
2 the date of the enactment of this part, establish a sulfur diox-  
3 ide emissions reduction requirement pursuant to subsection  
4 (a) for each State in the acid precipitation mitigation region,  
5 and shall, within one hundred and twenty days after the date  
6 of the enactment of this part, notify each State in such region  
7 of its sulfur dioxide emissions reduction requirement.

#### 8                   “PLAN REQUIREMENTS

9       “SEC. 184. (a) Each applicable State implementation  
10 plan shall, within one year after the date of the enactment of  
11 this part, be amended so as to contain emissions limitations,  
12 schedules, and timetables for compliance with such limita-  
13 tions, or such other enforceable measures as may be neces-  
14 sary for meeting the sulfur dioxide emissions reduction re-  
15 quirement specified under section 183 by December 31,  
16 1991. Such other measures may include, but are not limited  
17 to, the trading of emissions offsets within the acid precipita-  
18 tion mitigation region, early retirement of sources, and  
19 energy conservation.

20       “(b) In meeting its total sulfur dioxide emissions reduc-  
21 tion requirement, a State may substitute a reduction in nitro-  
22 gen oxide emissions for a reduction in sulfur dioxide emis-  
23 sions, in a ratio of two parts nitrogen oxide to one part sulfur  
24 dioxide.

1       “(c)(1) In meeting its emissions reduction requirement  
2 by December 31, 1991, no State shall be allowed to include  
3 any reduction in emissions from any major stationary source,  
4 or separate generating unit thereof, which was in operation  
5 before December 31, 1980, to the extent that such reduction  
6 represents compliance with Federal emission standards other  
7 than those imposed under this part.

8       “(2) In meeting such requirement by December 31,  
9 1991, a State may include any reduction in emissions from a  
10 major stationary source, or separate generating unit thereof,  
11 which was not in operation before December 31, 1980, to the  
12 extent that such reduction is greater than the reduction re-  
13 quired under Federal emission standards other than standards  
14 imposed under this part.

#### 15                   “AUTHORITY OF THE ADMINISTRATOR

16       “SEC. 185. (a)(1) The Administrator shall, within ninety  
17 days after submission of all plan amendments pursuant to  
18 section 184, review each applicable State implementation  
19 plan and make a finding as to whether the plan amendments  
20 will insure that a State's sulfur dioxide emissions reduction  
21 requirement will be met by December 31, 1991. The Admin-  
22 istrator shall approve any such plan amendments or parts  
23 thereof which he determines will insure that such emission  
24 reduction requirement will be met by December 31, 1991.

“(2) If the Administrator finds, pursuant to paragraph (1), that a State’s plan amendments or parts thereof submitted pursuant to section 184 will not insure that such State’s sulfur dioxide emissions reduction requirement will be met by December 31, 1991, the Administrator shall promptly, but in no event later than six months after making such a finding, prepare and publish revisions to such State’s implementation plan setting forth emission limitations, schedules, and timetables for compliance with such limitations, or other such measures (as described in section 184(a)) as may be necessary to insure that such State’s sulfur dioxide emissions reduction requirement will be met by December 31, 1991.

“(b)(1) The Administrator shall periodically, but not less often than every three years after approval of an amendment to a State implementation plan under subsection (a), review each such plan and make a finding as to whether such plan continues to insure that such emissions reduction requirement will be met by December 31, 1991.

“(2) If the Administrator finds, pursuant to paragraph (1), that a State implementation plan no longer insures that such emissions reduction requirement will be met by December 31, 1991, the Administrator shall take actions to insure compliance in the same manner as provided in subsection (a)(2).

“(c) If, at any time, the Administrator determines that a State is not carrying out its State implementation plan in a manner which insures that such emissions reduction requirement will be met by December 31, 1991, the Administrator shall, in addition to any other penalties or enforcement proceedings authorized under this Act, apply such additional sanctions or limitations on emissions with respect to any major emitting powerplant in such State as the Administrator determines to be necessary to insure that such requirement will be met by December 31, 1991.”.



# H. R. 4816

To amend the Clean Air Act to control acid precipitation, and for other purposes.

## IN THE HOUSE OF REPRESENTATIVES

OCTOBER 22, 1981

Mr. D'AMOURS introduced the following bill; which was referred to the Committee on Energy and Commerce

## A BILL

To amend the Clean Air Act to control acid precipitation, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

### STATE IMPLEMENTATION PLANS

4 SECTION 1. (a) Section 110(a)(1) of the Clean Air Act is  
5 amended by adding the following at the end thereof: "In the  
6 case of a State within the acid rain mitigation area, the plan  
7 required to be submitted under this paragraph shall also pro-  
8 vide for the control of acid deposition in accordance with part  
9 E of this title."

2

(b) Section 110(a)(2)(E) of such Act is amended by strik-  
ing out "and" immediately before "(ii)" and by adding the  
following before the semicolon at the end thereof: ", and (iii)  
complying with the requirements of part E (relating to the  
control of acid deposition)".

(c) Section 110(c) of such Act is amended by adding the  
following at the end thereof:

"(6) In any case in which—

"(A) a State required to comply with part E (re-  
lating to the control of acid deposition) fails to submit a  
plan which meets the requirements of part E within  
one year after the date of the enactment of this para-  
graph, or

"(B) the plan submitted by any such State is not  
approved by the Administrator within one year and  
four months after the date of the enactment of this  
paragraph,

no plan shall be promulgated by the Administrator under this  
subsection, but each unit listed under paragraph (1) or (2) of  
section 182 shall comply, not later than five years after the  
date of the enactment of this paragraph, with an emission  
limitation for sulfur dioxide of one and two-tenths pounds per  
million British thermal units on a thirty-day average. For  
purposes of section 113, 114, 116, 120, and 304, the re-  
quirement contained in the preceding sentence shall be treat-

1 ed as an emission limitation requirement of an applicable im-  
2 plementation plan.”

3 (d) Section 110(a)(2)(H) of such Act is amended by strik-  
4 ing out “or” immediately before “(ii)” and by adding the fol-  
5 lowing at the end thereof: “or (iii) whenever the Administra-  
6 tor finds, on the basis of information available to him that the  
7 plan does not comply with the provisions of part E (relating  
8 to the control of acid deposition);”.

9 (e) For purposes of section 110(a)(2)(H)(iii) of the Clean  
10 Air Act, as amended by this Act, the Administrator of the  
11 Environmental Protection Agency may submit a notice of a  
12 determination of noncompliance with the amendments made  
13 by this Act only after the expiration of a one-year period  
14 beginning on the date of the enactment of this Act. No appli-  
15 cable implementation plan under the Clean Air Act shall be  
16 treated as not complying with the amendments made by this  
17 Act before the date on which the Administrator submits such  
18 a notice.

#### 19 MITIGATION OF ACID DEPOSITION

20 SEC. 2. Title I of the Clean Air Act is amended by  
21 adding the following new part at the end thereof:

#### 22 “PART E—MITIGATION OF ACID PRECIPITATION

##### 23 “PURPOSE

24 “SEC. 181. The purpose of this part is to mitigate the  
25 harm to public health and welfare from acid deposition which

1 has its sources in the acid rain mitigation area by establishing  
2 sulfur dioxide emission limitations applicable to certain large  
3 stationary sources located in the area for purposes of—

4 “(1) preventing any net increase of sulfur dioxide  
5 emissions in the area, and

6 “(2) attaining, by the year 1990, a substantial and  
7 reasonably achievable reduction in the annual emis-  
8 sions of sulfur dioxide from the area.

#### 9 “LISTING OF CERTAIN STATIONARY SOURCES

10 “SEC. 182. Not later than ninety days after the date of  
11 the enactment of this Act the Administrator shall publish in  
12 the Federal Register—

13 “(1) a list of the fifty electric utility steam gener-  
14 ating units located in the acid rain mitigation area  
15 which had the highest annual emissions of sulfur diox-  
16 ide for the calendar year 1980 and which are not sub-  
17 ject to standards of performance under section 111;  
18 and

19 “(2) a list of all other electric utility steam gener-  
20 ating units located in that area which have a generat-  
21 ing capacity of more than one hundred megawatts and  
22 which are not subject to standards of performance  
23 under section 111.

"SIP PROVISIONS

"SEC. 183. (a) Each applicable implementation plan for each State in the acid rain mitigation area shall establish a statewide program for reduction of the net sulfur dioxide emissions from stationary sources located in that State. Such statewide program schedule shall consist of requirements which will achieve a reduction in the total annual emissions of sulfur dioxide by the year 1990 in an amount equal to the amount of emission reduction which would result if the following requirements were applied to each unit listed under section 182—

"(1) A schedule for each unit referred to in section 181(1) specifying emission reductions of sulfur dioxide from such unit to commence not later than two years after the date of the enactment of this Act and to provide for substantial additional reductions in emissions of sulfur dioxide in such amounts as will result in the lower of the following levels of emissions from the unit by the year 1990—

"(A) an average annual level of emissions equal to 15 percent of the baseline level for the unit (but not less than six-tenths pounds per million British thermal units); or

"(B) one and two-tenths pounds per million British thermal units, on a thirty-day average.

"(2) A schedule for each unit referred to in section 181(2) specifying emission reductions of sulfur dioxide from such unit to commence not later than three years after the date of the enactment of this Act and to provide for substantial additional reductions in emissions in such amounts as will result in average annual emissions of one and two-tenths pounds per million British thermal units from that unit by the year 1990.

"(3) The schedule under paragraph (1) shall provide for substantial reductions in each of three three-year periods before 1990. The schedule under paragraph (2) shall provide for substantial reductions in each of two three-year periods before 1990.

"(4) The baseline level for any unit for purposes of paragraph (1) shall be the lesser of—

"(A) the level of actual emissions of sulfur dioxide from that unit during the calendar year 1980, or

"(B) the allowable emission limitation (if any) applicable to that unit under the applicable implementation plan in effect on December 31, 1980.

The Administrator shall publish notice of such baseline level in the Federal Register not later than ninety days after the enactment of this section.

1       “(b)(1) The total emission reductions required under the  
2 schedule established under subsection (a) may be achieved by  
3 the application—

4               “(A) to the sources referred to in subsection (a),  
5 or

6               “(B) to any other sources of sulfur dioxide in the  
7 acid rain mitigation area  
8 of such enforceable emission reduction techniques as may be  
9 appropriate.

10       “(2) The emission reduction techniques used for pur-  
11 poses of achieving the total emission reduction required under  
12 the schedule under subsection (a) may include, but shall not  
13 be limited to—

14               “(A) measures which provide for use of transfer-  
15 able emission reduction credits under regulations pro-  
16 mulgated by the Administrator under section 184;

17               “(B) measures which provide for the granting of  
18 emission reduction credits for any source on the basis  
19 of energy conservation investments made by the owner  
20 or operator of that unit which have the effect of reduc-  
21 ing, in a quantifiable manner, sulfur dioxide emissions  
22 through identifiable reductions in energy use; and

23               “(C) measures which provide for retirement of  
24 sulfur dioxide sources at an earlier date than that pro-  
25 vided in schedules on file with the Internal Revenue

1       Service (or in the case of an electric utility schedules  
2 on file with the Federal Energy Regulatory Commis-  
3 sion or a State utility regulatory agency).

4       “(c) The plan provisions adopted under this section  
5 shall—

6               “(1) require—

7                       “(A) each source referred to in section 181,  
8 and

9                       “(B) each other source to which require-  
10 ments are applicable under State plan provisions  
11 adopted under subsection (b)

12 which is located in the acid precipitation mitigation  
13 area to conduct continuous emissions monitoring in ac-  
14 cordance with the regulations of the Administrator set  
15 forth in section 51.19(e) of the Code of Federal Regu-  
16 lations, as in effect on June 1, 1981, and to make the  
17 data obtained from such monitoring available to the  
18 Administrator and to the public; and

19               “(2) contain such assurances as the Administrator  
20 deems necessary to insure that the State will have  
21 adequate personnel, funding, and authority to carry out  
22 the plan provisions adopted pursuant to this section.

23               “(d) Any emission limitation or other requirement im-  
24 posed under provisions of an applicable implementation plan  
25 adopted pursuant to this section shall apply in lieu of any

1 emission limitation or other requirement applicable to such  
 2 unit under any other authority of law only where the emis-  
 3 sion limitation or other requirement adopted pursuant to this  
 4 section is more stringent than such other applicable limitation  
 5 or requirement.

6 "CONTROLLED TRADING

7 "SEC. 184. (a) The Administrator shall establish an  
 8 emission reduction credit program under this section for units  
 9 referred to in section 181 which are located in the acid rain  
 10 mitigation area.

11 "(b) The emission reduction credit program shall pro-  
 12 vide for—

13 "(1) the establishment of five emission reduction  
 14 credit regions within the acid rain mitigation area,

15 "(2) the issuance by the Administrator of emission  
 16 reduction credits to units referred to in section 181  
 17 which are located in such regions,

18 "(3) the recordation by the Administrator of such  
 19 credits on five regional registers and the saving for  
 20 future use (banking) of the credits on each of such reg-  
 21 isters, and

22 "(4) the purchase and sale of such credits for use  
 23 by other units within the same region.

24 (c) The five emission reduction credit regions established  
 25 under this section shall be as follows:

1 (1) the Northeast (Maine, New Hampshire, Ver-  
 2 mont, Massachusetts, Rhode Island, Connecticut, New  
 3 York, Delaware, New Jersey, Pennsylvania),

4 (2) the Midwest (Ohio, Indiana, West Virginia,  
 5 Kentucky, Illinois, Michigan),

6 (3) the Southeast (Maryland, Virginia, North  
 7 Carolina, South Carolina, Georgia, Tennessee),

8 (4) the Gulf States (Florida, Louisiana, Mississip-  
 9 pi, Alabama), and

10 (5) the Mississippi Valley (Minnesota, Wisconsin,  
 11 Iowa, Missouri, Arkansas).

12 "(d)(1) An emission reduction credit may be issued to  
 13 any stationary source which is located in the acid rain mitiga-  
 14 tion area and which enters into an arrangement with the  
 15 State in which the source is located in accordance with  
 16 guidelines published by the Administrator under this section.  
 17 Such arrangement shall provide that the emission limitations  
 18 applicable to that source will be reduced by an additional  
 19 amount (as described in paragraph (3)) and that such emission  
 20 limitations as so reduced will be contained in provisions in-  
 21 cluded in the applicable implementation plan or in operating  
 22 permit provisions which are enforceable under section 113  
 23 and 304.

24 "(2) The emission reduction credit issued to the source  
 25 by the Administrator shall be equal to the amount of such

1 additional emission reduction and shall remain effective for  
2 the period during which the otherwise applicable emission  
3 limitation would be effective (or for the useful life of the unit  
4 where the period of the otherwise applicable emission limita-  
5 tion exceeds such useful life).

6       “(3) The baseline for determining the amount of any  
7 additional emission reduction for which a credit is issued  
8 under this section shall be the lowest emission limitation  
9 which would otherwise apply (under the applicable imple-  
10 mentation plan, under section 111, or under any other provi-  
11 sion of law) to the source concerned for the period during  
12 which the credit is valid. Where a source is not subject to  
13 any otherwise applicable emission limitation, the baseline for  
14 determining the additional emission reduction shall be the  
15 annual level of actual sulfur dioxide emissions from the unit  
16 during the calendar year 1980 or such other more stringent  
17 baseline as may be appropriate as determined by the Admin-  
18 istrator under guidelines published under the Administrator.

19       “(e) Each applicable implementation plan adopted pur-  
20 suant to this part shall provide that any unit subject to an  
21 emission limitation under plan provisions adopted pursuant to  
22 this part may comply with such limitations in whole or in  
23 part through the purchase or exchange of emission reduction  
24 credits originally issued to one or more other stationary  
25 sources located in the same emission reduction credit region,

1 without regard to whether the other source or sources are  
2 located in the same State.”

### 3                               DEFINITIONS

4       SEC. 3. Section 302 of the Clean Air Act is amended by  
5 adding the following at the end thereof:

6       “(q) The term ‘acid precipitation mitigation area’ means  
7 the thirty-one States east of a line running south from the  
8 western borders of Minnesota, Iowa, Missouri, and  
9 Arkansas.”

# H. R. 4829

To amend the Clean Air Act to better protect against interstate transport of pollutants, to control existing and new sources of acid deposition, and for other purposes.

## IN THE HOUSE OF REPRESENTATIVES

OCTOBER 22, 1981

Mr. MOFFETT (for himself, Mr. GREGG, Mr. SMITH of Pennsylvania, Mr. BEIL-  
ENSON, Mr. MITCHELL of New York, Mr. MILLER of California, Mr. FOGLE-  
ETTA, Mr. GIBBONS, Mr. EDWARDS of California, Mr. BROWN of California,  
Mr. STARK, and Mr. FRANK) introduced the following bill; which was  
referred to the Committee on Energy and Commerce

## A BILL

To amend the Clean Air Act to better protect against interstate  
transport of pollutants, to control existing and new sources  
of acid deposition, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 That this Act may be cited as the "Acid Deposition Control  
4 Act".

5 SEC. 2. Title I of the Clean Air Act is amended by  
6 adding the following new part at the end thereof:

2

1 "PART E—INTERSTATE TRANSPORT AND ACID

2 PRECURSOR REDUCTION

3 "DEFINITION

4 "SEC. 181. As used in this part, the term 'acid deposi-  
5 tion region,' means the States of Alabama, Arkansas, Con-  
6 necticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa,  
7 Kentucky, Louisiana, Maine, Maryland, Massachusetts,  
8 Michigan, Minnesota, Mississippi, Missouri, New Hampshire,  
9 New Jersey, New York, North Carolina, Ohio, Pennsylva-  
10 nia, Rhode Island, South Carolina, Tennessee, Vermont,  
11 Virginia, West Virginia, Wisconsin, and the District of Co-  
12 lumbia.

13 "STUDY OF OTHER AREAS

14 "SEC. 182. The Administrator shall conduct a study of  
15 air pollution problems associated with long-range transport of  
16 pollutants in the portions of the continental United States not  
17 included in the acid deposition region. Not later than two  
18 years after the enactment of this section, the Administrator  
19 shall report to the Congress the results of such study.

20 "REGIONAL REDUCTION OF SULFUR DIOXIDE EMISSIONS;

21 STATE FRACTIONS

22 "SEC. 183. (a) There is hereby established a regional  
23 sulfur dioxide emission reduction target for the acid deposi-  
24 tion region to be achieved not later than ten years after the  
25 date of the enactment of this part in accordance with a



1 phased schedule of reductions. The target shall provide for  
2 such reduction in emissions as is necessary to achieve an  
3 annual average emission level which is ten million tons of  
4 sulfur dioxide per year below the 1980 baseline level.

5 “(b)(1) Not later than six months after the date of the  
6 enactment of this part, the Administrator shall compute and  
7 publish a sulfur dioxide emission reduction target and a  
8 phased emission reduction schedule for each State within the  
9 acid deposition region.

10 “(2) The State target shall be determined by multiplying  
11 the regional emission reduction target by the emission reduc-  
12 tion fraction for that State, as computed under subsection (c).  
13 Two or more States may, by interstate agreement, change  
14 the amount of the emission reduction targets for such States  
15 so long as the total reduction of the agreeing States equals  
16 the total reductions required from such States under the pre-  
17 ceding sentence.

18 “(3) The phased schedule for each State published by  
19 the Administrator under paragraph (1) shall provide for emis-  
20 sion reductions to begin not later than five years after the  
21 date of the enactment of this part, to be substantially com-  
22 plete not later than eight years after such date, and to  
23 achieve the State sulfur dioxide emission reduction target not  
24 later than ten years after such date.

1 “(c) The Administrator shall compute for each State in  
2 the acid deposition region the amount of sulfur dioxide emis-  
3 sions during the calendar year 1980 from electric utility  
4 steam generating units in that State which were emitting  
5 sulfur dioxide at an annual rate in excess of one and two-  
6 tenths pounds per million British thermal units during that  
7 year. The amount so determined shall be referred to in this  
8 section as the ‘excess amount’ for that State. The ratio which  
9 the excess amount for that State bears to the total of the  
10 excess amounts for all the States in the region shall be the  
11 emission reduction fraction for that State.

12 “(d) For purposes of this part, the 1980 baseline level  
13 for the region or for any State within the region shall be that  
14 amount determined by the Administrator which represents  
15 the lower of—

16 “(1) the actual annual level of sulfur dioxide emis-  
17 sions during the calendar year 1980 for the region or  
18 the State as the case may be, or

19 “(2) the annual level of sulfur dioxide emissions  
20 which would result from compliance, during the ten-  
21 year period after the date of the enactment of this part,  
22 with the requirements of applicable implementation  
23 plans under section 110, as in effect on December 31,  
24 1980, for the State or region, as the case may be.

1       “(e) The Administrator's computations under subsec-  
2       tions (c) and (d) shall be based upon information submitted to  
3       the Administrator by the State and upon such other informa-  
4       tion and reasonable estimates as may be available to the Ad-  
5       ministrator.

## "STATE PROGRAMS TO REDUCE SULFUR DIOXIDE EMISSIONS

8       “SEC. 184. (a) Not later than two years after the date  
9 of the enactment of this part, each State in the acid deposi-  
10 tion region shall prepare, publish, and submit to the Adminis-  
11 trator a State program to reduce annual sulfur dioxide emis-  
12 sions in that State in accordance with the phased schedule for  
13 that State determined under section 183(b).

14       “(b) The program required to be adopted under this sec-  
15       tion shall be approved by the Administrator not later than  
16       four months after the date of its submission if, after taking  
17       into consideration the comments of Governors of other States  
18       in the acid deposition region, the Administrator determines  
19       that the program—

20           “(1) was adopted after public notice and opportu-  
21           nity for hearing and after submission to the Governors  
22           of each of the other States within the acid deposition  
23           region for their comments; and

24           “(2) contains enforceable measures to achieve a  
25       reduction in sulfur dioxide emissions in accordance

1 with the phased reduction schedule set forth in the  
2 State program, including emission limitations applica-  
3 ble to sources within the State, monitoring require-  
4 ments adequate to insure compliance with such emis-  
5 sion limitations, schedules for compliance by those  
6 sources, and such other measures as may be deter-  
7 mined appropriate in accordance with subsection (c).

8 No hearing or opportunity for submission of comments need  
9 be provided by the Administrator to any person other than a  
10 State for purposes of making any determination under this  
11 subsection where the State plan was adopted after adequate  
12 notice and opportunity for public comment.

13       “(c) A State program under this section shall include  
14 enforceable continuous emission reduction measures, and  
15 may include, but shall not be limited to the following meas-  
16 ures:

17           “(1) least emissions dispatch to meet electric gen-  
18       erating demand at existing generating capacity where  
19       such dispatch is appropriate and in accordance with  
20       other applicable law;

21           “(2) retirement of major stationary sources at an  
22 earlier date than provided in schedules on file with the  
23 Federal Energy Regulatory Commission, the Internal  
24 Revenue Service, or State utility regulatory agencies;

“(3) investments in energy conservation where reductions in emissions can be identified with such investments;

“(4) measures which provide for the purchase and sale of transferable emission reduction credits on a statewide basis or on a regional basis in accordance with section 186;

“(5) precombustion cleaning of fuels;

“(6) fuel switching;

“(7) flue gas desulfurization; and

“(8) other combustion process changes.

“(d) For purposes of determining compliance with any requirement of this part or any program adopted under this part by any State or by any person subject to the provisions of this part a reduction of two units by weight in emissions of oxides of nitrogen may be substituted for each unit of required reductions in emissions of sulfur dioxide.

“ENVIRONMENTAL PROTECTION AGENCY ALTERNATIVE  
PROGRAM

“SEC. 185. (a)(1) If a State program under section 184 has not been adopted by a State within two years after the date of the enactment of this part or approved by the Administrator for a State within two years and four months after the date of the enactment of this part, then each person

owning or operating an electric utility steam generating unit in that State which—

“(A) is a major stationary source (within the meaning of section 302(j));

“(B) is not subject to new source performance standards under section 111(b); and

“(C) actually emitted or was permitted, under the applicable implementation plan, to emit sulfur dioxide during the calendar year 1980 at an annual average rate in excess of one and two-tenths pounds per million British thermal units

shall submit to the Administrator a plan and schedule for reducing emissions from that unit and all other such units owned or operated by such person and located in that State. Such plan and schedule shall be submitted before the date three years after the date of the enactment of this Act.

“(2) The plan and schedule under paragraph (1) shall insure that the total of the annual emissions from all of the units referred to in paragraph (1) which are owned or operated by such person and located in such State will be reduced to an amount equivalent to the total annual emission level which would result if each of the units met an emission level of one and two-tenths pounds of sulfur dioxide per million British thermal units (measured on the basis of a thirty-day average). Such reduction shall be in accordance with a

1 phased schedule promulgated by the Administrator and shall  
 2 provide for emission reductions to begin not later than five  
 3 years after the date of the enactment of this part, to be sub-  
 4 stantially complete not later than eight years after such date,  
 5 and to be finally complete not later than ten years after such  
 6 date.

7       “(b) The Administrator shall approve a plan submitted  
 8 by any person under subsection (a) for the units referred to in  
 9 subsection (a) which are owned or operated by such person  
 10 and located in the State concerned if the plan—

11           “(1) contains emission limitations or other en-  
 12 forceable requirements applicable to those units (includ-  
 13 ing any measure referred to in section 184(c)) and  
 14 schedules of compliance which are sufficient to insure  
 15 compliance with the emission reduction schedule speci-  
 16 fied in subsection (a); and

17           “(2) contains requirements for monitoring of sulfur  
 18 dioxide emissions from such units which are adequate  
 19 to insure compliance with such emission limitations or  
 20 other requirements and such schedules of compliance.

21       “(c) In any case in which a person subject to subsection  
 22 (a) has not submitted a plan which is approved by the Admin-  
 23 istrator in accordance with subsection (b), each unit referred  
 24 to in subsection (a) owned or operated by such person shall  
 25 comply, not later than five years after the date of the enact-

1 ment of this Act, with an emission limitation for sulfur diox-  
 2 ide of one and two-tenths pounds per million British thermal  
 3 units on a thirty-day average.

#### 4                           “CONTROLLED TRADING

5       “SEC. 186. (a) The Administrator shall establish an  
 6 emission reduction credit program under this section for units  
 7 referred to in section 185 which are located in the acid depo-  
 8 sition region.

9       “(b) The emission reduction credit program shall pro-  
 10 vide for—

11           “(1) the establishment of five emission reduction  
 12 credit regions within the acid deposition region,

13           “(2) the issuance by the Administrator of emission  
 14 reduction credits to stationary sources of sulfur dioxide  
 15 which are located in such regions,

16           “(3) the recordation by the Administrator of such  
 17 credits on five regional registers and the saving for  
 18 future use (banking) of the credits on each of such reg-  
 19 isters, and

20           “(4) the purchase and sale of such credits for use  
 21 by other units within the same region.

22       “(c) The five emission reduction credit regions estab-  
 23 lished under this section shall be as follows:

“(1) the Northeast (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Delaware, New Jersey, Pennsylvania),

“(2) the Midwest (Ohio, Indiana, West Virginia, Kentucky, Illinois, Michigan),

“(3) the Southeast (Maryland, Virginia, North Carolina, South Carolina, Georgia, Tennessee),

“(4) the Gulf States (Florida, Louisiana, Mississippi, Alabama), and

“(5) the Mississippi Valley (Minnesota, Wisconsin, Iowa, Missouri, Arkansas).

“(d)(1) An emission reduction credit may be issued to any stationary source of sulfur dioxide which is located in the acid deposition region and which enters into an arrangement with the State in which the source is located in accordance with guidelines published by the Administrator under this section. Such arrangement shall provide that the emission limitations applicable to that source will be reduced by an additional amount as determined under paragraph (2) and that such emission limitations, as so reduced, will be contained in provisions included in the applicable implementation plan or in operating permit provisions which are enforceable under sections 113 and 304. The emission reduction credit issued to the source by the Administrator shall be equal to the amount of such additional emission reduction and shall

remain effective for the period during which the otherwise applicable emission limitation would be effective (or for the useful life of the unit where the period of the otherwise applicable emission limitation exceeds such useful life).

“(2) The baseline for determining the amount of any additional emission reduction for which a credit is issued under this section shall be the lowest emission limitation which would otherwise apply (under the applicable implementation plan, under section 111, or under any other provision of law) to the source concerned for the period during which the credit is valid. Where a source is not subject to any otherwise applicable emission limitation, the baseline for determining the additional emission reduction shall be the average annual level of actual sulfur dioxide emissions from the unit during the calendar year 1980 or such other more stringent baseline as may be appropriate as determined by the Administrator under guidelines published under the Administrator.

“(e) Each applicable implementation plan adopted pursuant to this part shall provide that any person subject to an emission limitation under a plan or program adopted pursuant to this part may comply with such limitations in whole or in part through the purchase or exchange of emission reduction credits originally issued to one or more other stationary sources located in the same emission reduction credit region,

1 without regard to whether the other source or sources are  
2 located in the same State.

### 3 "ENFORCEMENT

4 "SEC. 187. (a) For purposes of sections 113, 114, 116,  
5 120, and 304—

6 "(1) the requirement to submit a plan under sec-  
7 tion 185(a);

8 "(2) any requirement of a program adopted under  
9 section 184,

10 "(3) any requirement of a plan approved by the  
11 Administrator under subsection (b) of section 185, and

12 "(4) an emission limitation in effect under subsec-  
13 tion (c) of section 185

14 shall be treated as an emission limitation requirement of an  
15 applicable implementation plan.

16 "(b)(1) Any State or political subdivision of a State may  
17 petition the Administrator at any time after the approval of a  
18 State program under section 184 for a determination that the  
19 program will not achieve the emission reduction required by  
20 section 184(a) by the date set forth in such section 184(a),  
21 and any State or political subdivision of a State may petition  
22 the Administrator at any time after the approval of a plan  
23 under section 185(b) for a determination that the plan will  
24 not achieve the emission reduction required by section 185(a)  
25 by the date set forth in section 185(a).

1 "(2) Within one hundred and twenty days after the re-  
2 ceipt of any petition under paragraph (1) and after providing  
3 notice and opportunity for public comment, the Administrator  
4 shall make such a determination or deny the petition.

5 "(3) Notwithstanding subsection (b) or (e) of section  
6 307, any State or other person who participated in the pro-  
7 ceedings conducted by the Administrator under paragraph (2)  
8 may file a petition for review of any determination or denial  
9 of the Administrator under paragraph (2). Such petition may  
10 be filed only in the United States Court of Appeals for the  
11 District of Columbia within ninety days after the date on  
12 which notice of such determination or denial appears in the  
13 Federal Register. In any judicial proceeding under this sec-  
14 tion, the court may award costs of litigation (including rea-  
15 sonably attorney and expert witness fees) whenever it deter-  
16 mines such award is appropriate."

**S. 3041**

[Report No. 97-666]

To amend the Clean Air Act.

## IN THE SENATE OF THE UNITED STATES

NOVEMBER 15, 1982

Mr. STAFFORD, from the Committee on Environment and Public Works, reported, under authority of the order of the Senate of (October 2 (legislative day, September 8), 1982, the following original bill; which was read twice and placed on the calendar

**A BILL**

To amend the Clean Air Act.

- 1 *Be it enacted by the Senate and House of Representa-*  
 2 *tives of the United States of America in Congress assembled,*  
 3 That this Act may be cited as the "Clean Air Act Amend-  
 4 ments of 1982".

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SOURCES

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1 INTERSTATE TRANSPORT AND ACID PRECURSOR

2 REDUCTION

3 SEC. 120. Title I of the Clean Air Act is amended by  
 4 adding the following new part:

5 "PART E—INTERSTATE TRANSPORT AND ACID  
 6 PRECURSOR REDUCTION

7 "FINDINGS AND PURPOSES

8 "SEC. 180. (a) The Congress finds that:

9 "(1) the long-range transport of pollutants and  
 10 their transformation products is an interstate and inter-  
 11 national problem;

12 "(2) current levels of emissions of air pollutants  
 13 from existing sources as well as increased emissions  
 14 from new and existing sources threaten public health  
 15 and welfare and the environment in States and coun-  
 16 tries other than those in which emitted;

17 "(3) reduction of total regional atmospheric load-  
 18 ing of pollutants such as sulfur oxides and nitrogen  
 19 oxides will enhance protection of public health and  
 20 welfare and the environment;

21 "(4) more effective regulation of the interstate  
 22 transport of air pollutants is needed in order to protect  
 23 the health and welfare of the citizens of downwind  
 24 States and the economic growth opportunities of down-  
 25 wind States; and



“(5) in particular,

“(A) the deposition of acid compounds from the atmosphere is causing and contributing to widespread long-term ecosystem degradation;

“(B) the principal source of the acid compounds in the atmosphere, and their precursors, is the combustion of fossil fuels;

“(C) the problem of acid deposition is of national and international significance and cannot be addressed adequately without Federal intervention;

“(D) control strategies and technology for precursors to acid deposition exist now that are economically feasible; and

“(E) current and future generations of Americans will be more adversely affected by delayed action, so that efforts to remedy the problem should commence now.

“(b) The purposes of this part are to:

“(1) protect public health and welfare and the environment from any actual or potential adverse effect caused by ambient concentrations or deposition of air pollutants, including the products of atmospheric transformation of pollutants; and

“(2) preserve the rights and responsibilities of States to protect the public health and welfare and the environment of their citizens from air pollution originating in other States.

#### “ESTABLISHMENT OF REGION

“SEC. 181. There is hereby established a long-range transport corridor, hereafter referred to as the “acid deposition impact region,” consisting of the States of Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and the District of Columbia.

#### “RESEARCH AND SPECIAL STUDIES

“SEC. 182. (a) The Administrator shall conduct a study of air pollution problems associated with the long-range transport of pollutants in the portions of the continental United States not included in section 181. Not later than two years after the enactment of this section, the Administrator shall report to the Congress the results of such study.

“(b)(1) The Acid Precipitation Task Force established under title VII of the Energy Security Act (Public Law 96-294) shall submit to the Committee on Environment and

1 Public Works of the United States Senate and the Committee  
2 on Energy and Commerce of the United States House of  
3 Representatives, two comprehensive reports, one by Decem-  
4 ber 31, 1985, and one by December 31, 1987, which shall  
5 present the findings of the research conducted under section  
6 704(b) of such Act, including recommendations, based upon  
7 existing scientific knowledge, for reducing acid deposition and  
8 its effects.

9       “(2) In addition to any other funds authorized to be ap-  
10 propriated for the Acid Precipitation Task Force for the pur-  
11 poses of carrying out the activities required by section 704 of  
12 title VII of the Energy Security Act, there are authorized to  
13 be appropriated \$10,000,000 in each of the fiscal years 1983,  
14 1984, 1985, 1986, and 1987.

15       “(c)(1) The Task Force established by title VII of the  
16 Energy Security Act shall also conduct and support research  
17 on advanced flue-gas cleaning and precombustion fuel treat-  
18 ment technologies and inherently low-emission combustion  
19 processes (including atmospheric and pressurized fluidized  
20 bed combustion).

21       “(2) There are authorized to be appropriated to a  
22 member of such Task Force for fiscal years 1984 through  
23 1988 \$50,000,000 for the purposes of funding a joint project  
24 among the Tennessee Valley Authority and such others as  
25 may be appropriate, including a research institute represent-

1 ing the electric utility industry and individual electric utili-  
2 ties, for the planning, design, construction, operation, and  
3 testing of a demonstration facility for the generation of elec-  
4 tricity using an atmospheric fluidized bed combustion process.  
5 The provision of such funding shall be contingent on non-  
6 Federal participants assuming at least 75 per centum of the  
7 costs of such joint project.

8       “(d)(1) Not later than six months after enactment of this  
9 section there shall be established an Acid Precipitation Scien-  
10 tific Review Board with not more than 15 members who  
11 shall be appointed by the National Academy of Sciences.

12       “(2) The Board shall examine and consider all available  
13 information regarding the causes, extent and potential envi-  
14 ronmental impacts of acid deposition, including a review of  
15 all the activities being performed by the Acid Precipitation  
16 Task Force under section 704(b) of the Energy Security Act.

17       “(3) The Board shall submit to the Committee on Envi-  
18 ronment and Public Works of the United States Senate and  
19 the Committee on Energy and Commerce of the United  
20 States House of Representatives at least two comprehensive  
21 reports, one not later than June 30, 1986, and one not later  
22 than June 30, 1988, on the results of its examination under-  
23 taken in accordance with paragraph (2), including a review of  
24 the report(s) submitted to the Committees of Congress by the  
25 Task Force as required by subsection (b)(1) of this section,

1 together with the Board's own recommendations for reducing  
2 acid deposition and its effects.

3       “(4) There are authorized to be appropriated  
4 \$1,000,000 for each of fiscal years 1983 through 1988, for  
5 the purposes of carrying out the activities required by this  
6 subsection.

7       “(e)(1) Promptly after the date established by section  
8 186, the Administrator shall submit to the Committee on En-  
9 vironment and Public Works of the United States Senate and  
10 the Committee on Energy and Commerce of the United  
11 States House of Representatives a report describing the  
12 emission limitation and other enforceable measures adopted  
13 by the States and approved by the Administrator under sec-  
14 tion 185(b) or in effect under section 186, for all States in the  
15 acid deposition impact region established by section 181.

16       “(2) The Office of Technology Assessment shall analyze  
17 the environmental benefits to be gained through the imple-  
18 mentation of the control requirements described by the Ad-  
19 ministrator in accordance with paragraph (1) of this subsec-  
20 tion, the costs of implementing such control requirements,  
21 and any potential effects on coal production or markets of  
22 implementing such control requirements, on both an aggre-  
23 gate regional and a State-by-State basis. The Office of Tech-  
24 nology Assessment shall report its findings to the Committee  
25 on Environment and Public Works of the United States

1 Senate and the Committee on Energy and Commerce of the  
2 United States House of Representatives no later than six  
3 months after the submission of the report required in para-  
4 graph (1).

5       “(f) Upon receipt of the reports required by subsections  
6 (b)(1), (d), (e)(1), and (e)(2), the Committee on Environment  
7 and Public Works of the United States Senate and the Com-  
8 mittee on Energy and Commerce of the United States House  
9 of Representatives shall conduct hearings on the matters con-  
10 tained in such reports and take such other action as each  
11 such committee deems appropriate.

12       “(g) The Administrator shall develop an inventory of  
13 sources of oxides of nitrogen in the acid deposition impact  
14 region established by section 181 and in each State thereof.  
15 Not later than four years after enactment of this part the  
16 Administrator shall report to the Committee on Environment  
17 and Public Works of the United States Senate and the Com-  
18 mittee on Energy and Commerce of the United States House  
19 of Representatives on (1) the inventory of sources of oxides of  
20 nitrogen developed under this subsection, (2) control technol-  
21 ogy and methods for new and existing sources for oxides of  
22 nitrogen, and (3) any recommendations for requirements to  
23 reduce existing emissions or control new emissions of oxides  
24 of nitrogen to reduce acid deposition.

1       “(h) The Administrator and the Secretary of the Treas-  
 2       ury shall jointly conduct a study of the potential for a system  
 3       of fees on the generation of electrical energy in the acid depo-  
 4       sition impact region established by section 181, to be used to  
 5       finance the reductions in emissions required by this part, in-  
 6       cluding the equitable distribution of the funds resulting from  
 7       such fees. A report of such study shall be submitted to the  
 8       Congress not later than six months after submittal of the  
 9       report required by subsection (e)(1) of this section.

10       “(i)(1) The Administrator is authorized to conduct or  
 11       make grants to any State or interstate agency for the pur-  
 12       poses of conducting the development, refinement and practi-  
 13       cal demonstration of new, improved, or innovative methods of  
 14       neutralizing or restoring the buffering capacity of acid altered  
 15       bodies of water that no longer can support game fish species;  
 16       and methods of removing from bodies of water toxic metals  
 17       or other toxic substances mobilized by acid deposition, and to  
 18       include in such grants such amounts as necessary for the pur-  
 19       pose of reports, plans and specifications in connection there-  
 20       with.

21       “(2) Grants under this subsection shall not be made for  
 22       any project in an amount exceeding 75 per centum of the  
 23       costs thereof as determined by the Administrator.

1       “(3) Grants under this subsection shall not be made for  
 2       any project that involves bodies of water that did not contain  
 3       game fish as established by State law prior to 1970.

4       “(4) For the purposes of this subsection there are hereby  
 5       authorized to be appropriated \$5,000,000 for each of the  
 6       fiscal years 1983, 1984, and 1985.

#### 7                   “ACID PRECURSOR CONTROLS

8       “SEC. 183. (a) There shall be achieved a reduction in  
 9       annual emissions of sulfur dioxide in the acid deposition  
 10       impact region established under section 181 of this Act of  
 11       8,000,000 tons from the total actual annual level of such  
 12       emissions between January 1, 1980, and December 31,  
 13       1980. Such reduction shall be achieved pursuant to a phased  
 14       reduction and completed no later than January 1, 1995.

15       “(b)(1) Emissions of sulfur dioxide from major stationary  
 16       sources which did not begin operation before January 1,  
 17       1981, or which have increased emissions since January 1,  
 18       1981 (to the extent of such increase), calculated on an annual  
 19       basis, shall be added to the amount of sulfur dioxide which  
 20       the State in which such sources are located is required to  
 21       reduce not later than January 1, 1995, under section 184 or  
 22       185(a).

23       “(2)(A) Such emissions shall not be so added in any  
 24       State which during 1980 had no major stationary source  
 25       which was a utility boiler which had an actual annual aver-

1 age emission rate greater than 1.2 pounds of sulfur dioxide  
2 per million British thermal units of heat input.

3       “(B) Increases in emissions of sulfur dioxide from utility  
4 boilers which are coal capable as defined under section 301(a)  
5 of the Fuel Use Act and which convert to the use of coal as a  
6 primary fuel shall be so added only to the extent such emis-  
7 sions from a particular source exceed 1.5 pounds of sulfur  
8 dioxide per million British thermal units of heat input on an  
9 annual average.

10       “(c) Other than as provided in subsection (b)(2)(B), no  
11 major stationary source in such region which began operation  
12 before January 1, 1981, shall increase its actual rate of emis-  
13 sions of sulfur dioxide over that experienced by such source  
14 during calendar year 1980, unless there has been identified  
15 for such source a simultaneous net reduction in emissions of  
16 sulfur dioxide at one or more points in such region—

17               “(1) in excess of the emissions which potentially  
18 would result from the proposed increase in emission  
19 rate, and

20               “(2) not otherwise required by a State implemen-  
21 tation plan under section 110 of this Act or under sec-  
22 tion 184, 185, or 186 of this part.

23 This subsection shall not apply to increases in actual rates of  
24 emissions of sulfur dioxide from sources in any State in which  
25 for each major stationary source of sulfur dioxide which was

1 a utility boiler the emission limitation in effect under an ap-  
2 plicable implementation plan at the time of such increases is  
3 less than or equal to 1.2 pounds of sulfur dioxide per million  
4 British thermal units of heat input on an annual average.

5       “(d) No major stationary source of sulfur dioxide shall  
6 commence operation after January 1, 1995, in such region  
7 unless there has been identified for such source a simulta-  
8 neous net reduction in emissions of sulfur dioxide at one or  
9 more points in such region—

10               “(1) in excess of the emissions which potentially  
11 would result from the proposed new source, and

12               “(2) not otherwise required by a State implemen-  
13 tation plan under section 110 of this Act or under sec-  
14 tion 184, 185, or 186 of this part.

15 This subsection shall not apply to any major stationary  
16 source which adopts the best available control technology, as  
17 defined in section 169(3) or 171(3) as appropriate for the lo-  
18 cation of the proposed new source, and which attains at least  
19 the most stringent emission limitation shown by an adequate  
20 operating history to have been achieved in practice by a  
21 major stationary source of the same size, type, and class  
22 within the region established under section 181 of this Act.

23       “(e) No major stationary source of oxides of nitrogen in  
24 such region which began operation before January 1, 1981,  
25 shall increase its actual rate of emissions of oxides of nitrogen

1 as measured in pounds of oxides of nitrogen per million Brit-  
 2 ish thermal units of heat input over the greater of that expe-  
 3 rienced by such source during calendar year 1980, or during  
 4 the thirty-day period (excluding days on which such source  
 5 did not operate) immediately preceding the date of enact-  
 6 ment of this subsection, unless there has been identified for  
 7 such source a simultaneous net reduction in emissions of  
 8 oxides of nitrogen at one or more points in such region—

9       “(1) in excess of the emissions which potentially  
 10       would result from the proposed increase in emission  
 11       rate, and

12       “(2) not otherwise required by a State implemen-  
 13       tation plan under section 110 of this Act.

14 The preceding sentence shall not apply to emissions of oxides  
 15 of nitrogen from utility boilers which are coal capable as de-  
 16 fined under section 301(a) of the Fuel Use Act and which  
 17 convert to the use of coal as a primary fuel.

#### 18 “REGIONAL SULFUR DIOXIDE REDUCTION ALLOCATION

19       “SEC. 184. (a) The Governors of all of the thirty-one  
 20 States within the acid deposition impact region shall enter  
 21 into negotiations to establish sulfur dioxide emission reduc-  
 22 tion requirements for each State within the region sufficient  
 23 to achieve the total reduction required under section 183(a).

24       “(b) An agreement to allocate sulfur dioxide emission  
 25 reductions entered into under this section shall be binding

1 and enforceable under sections 113 and 304 of this Act on  
 2 each State within the acid deposition impact region, but only  
 3 upon notification to the Administrator by the Governors of 75  
 4 per centum of the States in the acid deposition impact region,  
 5 within eighteen months after enactment of this part, that  
 6 such agreement has been reached.

#### 7 “STATE SULFUR DIOXIDE REDUCTION REQUIREMENTS

8       “SEC. 185. (a)(1) If the Governors fail to reach agree-  
 9 ment within eighteen months after the enactment of this part  
 10 for the allocation of sulfur dioxide reduction under section  
 11 184 sufficient to achieve the requirements of section 183(a),  
 12 each State shall be required to achieve within its borders a  
 13 reduction in annual sulfur dioxide emissions equal to that  
 14 fraction of 8,000,000 tons which is the ratio of all the actual  
 15 utility emissions in such State in excess of 1.5 pounds of  
 16 sulfur dioxide per million British thermal units of heat input  
 17 averaged over the period January 1, 1980, to December 31,  
 18 1980, to the total in all States in the region of all the actual  
 19 utility emissions in excess of 1.5 pounds of sulfur dioxide per  
 20 million British thermal units of heat input averaged over such  
 21 period.

22       “(2) The Governors of any two or more States within  
 23 the region may by agreement reallo among agreeing States  
 24 the reductions required under subsection (a)(1) provided that

1 the total reductions equal the total required under subsection  
2 (a)(1).

3       “(b)(1) Not later than forty-two months after the enact-  
4 ment of this part, each State shall adopt enforceable meas-  
5 ures to achieve the reduction in sulfur dioxide emissions re-  
6 quired by section 184 or subsection (a) of this section, includ-  
7 ing emission limitations and schedules for compliance for  
8 sources within such State and other means of emission reduc-  
9 tion in accordance with section 187 of this Act. The Gover-  
10 nor of such State shall submit such measures to the Adminis-  
11 trator for review in accordance with paragraph (2) of this  
12 subsection and section 110(a)(3), and to the Governors of all  
13 other States in the acid deposition impact region for com-  
14 ment.

15       “(2) Review and approval of measures submitted under  
16 this subsection shall be as provided in section 110(a)(3). The  
17 Administrator shall approve such measures submitted under  
18 paragraph (1) of this subsection if, taking into consideration  
19 the comments of Governors of other States in such region,  
20 the Administrator finds that such measures—

21               “(A) contain enforceable requirements for continu-  
22 ous emission reduction,

23               “(B) contain requirements for monitoring by the  
24 source and enforcement agencies to assure that the  
25 emission limitations are being met, and

1               “(C) are adequate to achieve the reduction in  
2 sulfur dioxide emissions for such State required pursu-  
3 ant to section 184 or subsection (a) of this section  
4 within the time specified in section 183(a) of this Act.

5       “(3) Each emission limitation, schedule for compliance  
6 or other measure adopted and approved under this subsection  
7 shall be deemed a requirement of the State implementation  
8 plan approved or promulgated for such State under section  
9 110 of this Act.

10       “(4) In the case of any major stationary source in a  
11 State listed in section 181, which is not by December 31,  
12 1985, in full compliance with the applicable implementation  
13 plan for sulfur dioxide in effect on January 1, 1981, the  
14 owner or operator of such source shall be subject to:

15               “(A) the emission limitation established by section  
16 186 for all facilities in such State owned or operated  
17 by such owner or operator, and

18               “(B) a noncompliance penalty established under  
19 section 120 for each such source or facility, including  
20 each electric generating facility, for the period from the  
21 original date for compliance under the applicable imple-  
22 mentation plan until actual compliance with the emis-  
23 sion limitation established under this paragraph.

24       “(5)(A) The enforceable measures adopted under this  
25 subsection shall include schedules for compliance which



1 specify actions to be performed leading toward final compli-  
 2 ance and increments of progress to be achieved by dates in  
 3 advance of the dates by which the State requires each partic-  
 4 ular source to comply with the emission limitation necessary  
 5 to attain the reduction for such State under section 184 or  
 6 185(a). The State in adopting such measures and the Admin-  
 7 istrator in reviewing such measures shall be encouraged to  
 8 stage or phase such compliance dates so that to the extent  
 9 practicable significant emission reduction under this part is  
 10 achieved prior to January 1, 1995.

11 "(B) Each major stationary source which proposes to  
 12 comply with an emission limitation established under this  
 13 subsection or section 186 by any means other than an inno-  
 14 vative system of continuous emission reduction or the re-  
 15 placement of existing facilities with new facilities of substan-  
 16 tially lower emissions shall comply with such emission limita-  
 17 tion not later than January 1, 1993.

18 "MAJOR STATIONARY SOURCE SULFUR DIOXIDE

19 REDUCTION REQUIREMENTS

20 "SEC. 186. In any State in the acid deposition impact  
 21 region established by section 181 of the Act which has not in  
 22 accordance with section 185(b)(1) of this Act adopted meas-  
 23 ures to achieve the reduction required by section 184(a) or  
 24 section 185(a) of this Act within forty-two months after en-  
 25 actment of this part, or which has not had such measures

1 approved by the Administrator under section 185(b)(2) of this  
 2 Act within six months after the submission of such measures,  
 3 the owner or operator of each fossil-fuel-burning electric gen-  
 4 erating facility which is a major stationary source which is  
 5 not subject to section 111(a) shall comply with an emission  
 6 limitation or limitations for all such facilities owned or oper-  
 7 ated by the same entity in such region equivalent to an aver-  
 8 age among such facilities of 1.2 pounds of sulfur dioxide per  
 9 million British thermal units of heat input on a thirty-day  
 10 average. The owner or operator of each such facility shall  
 11 submit to the Administrator a plan and schedule of compli-  
 12 ance for achieving such emission limitation or equivalent  
 13 emission reduction in accordance with section 187 of this  
 14 Act, not later than four years after the enactment of this part  
 15 or six months after the date on which such owner or operator  
 16 becomes subject to such emission limitation, whichever is  
 17 later. The Administrator shall approve such plan and sched-  
 18 ule for compliance if it—

19 "(A) contains enforceable requirements for con-  
 20 tinuous emission reduction;

21 "(B) contains requirements for monitoring by the  
 22 source and enforcement agencies to assure that the  
 23 emission limitations are being met; and

1           “(C) will achieve the emission reduction required  
2           by this section at the earliest practicable date, but no  
3           later than January 1, 1995.

4   Failure of such owner or operator to submit such approvable  
5   plan and schedule within the time provided in this section,  
6   failure to comply with the plan and schedule of compliance,  
7   and failure to achieve the emission reduction required by this  
8   section at the earliest practicable date, but no later than Jan-  
9   uary 1, 1995, shall be violations of emission limitations for  
10  the purposes of sections 113, 120, and 304 of this Act.

11       “ENFORCEABLE EMISSION REDUCTION PROGRAMS

12       “SEC. 187. (a) For the purposes of maintaining the limi-  
13       tation on emissions required by section 183(c) of this Act or  
14       attaining emission reductions required by section 183(a), 184,  
15       185, or 186 of this Act, the following methods or programs  
16       for net emission reduction may be used, in addition to en-  
17       forceable continuous emission reduction measures, by a State  
18       or the owner or operator of a source, if emission limitations  
19       under such methods or programs are enforceable by the Fed-  
20       eral Government, States other than those in which the emis-  
21       sions occur, and citizens under section 304 of this Act:

22           “(1) least emissions dispatch to meet electric gen-  
23       erating demand at existing generating capacity;

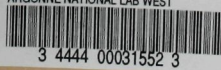
24           “(2) retirement of major stationary sources at an  
25       earlier date than provided in schedules on file with the

1       Federal Energy Regulatory Commission, the Internal  
2       Revenue Service, or State utility regulatory agencies;

3           “(3) investments in energy conservation where re-  
4       ductions in emissions can be identified with such  
5       investments;

6           “(4) trading of emission reduction requirements  
7       and actual reductions on a State or regional basis, for  
8       which States and the Administrator are authorized to  
9       establish emission reduction banks or brokerage institu-  
10      tions to facilitate such trading; and

11          “(5) precombustion cleaning of fuels.”.



X

